FILE NO. K-1683

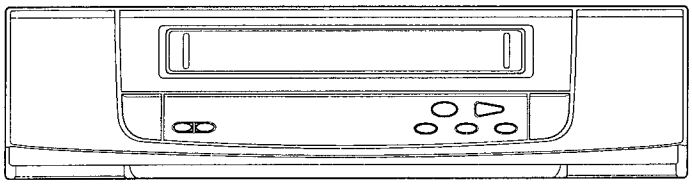
SANYO

SERVICE MANUAL

Video Cassette Recorder

VWM-260
(Product Code : 143 170 19)
(U.S.A.)

VHR-M13
(Product Code : 143 170 33)
(NTSC General)



VHS

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CIRCUIT DIAGRAMS (Refer to the separate volume)

Please see other materials with Reference number given in table below.

Materials	Model No.	Reference No.
Mechanism Manual	V95 I Mechanism	MM531433
	V95 II Mechanism	MS531500

NOTE: 1. Parts order must contain model number, part number, and description.
2. Substitute parts may be supplied as the service parts.
3. N.S.P. : Not available as service parts.

Design and specifications are subject to change without notice.

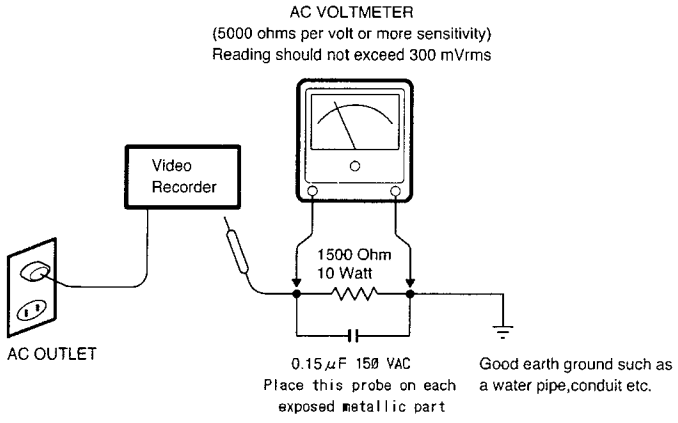
SAFETY PRECAUTIONS

WARNING:

Service should not be attempted by anyone unfamiliar with the necessary precautions for this recording or playback equipment. The following precautions are necessary during servicing:

1. Many electrical and mechanical parts in this recorder have special safety-related characteristics for providing protection against shock, fire and other hazards. These characteristics often go unnoticed in a visual inspection, and the protection afforded by them cannot necessarily be obtained by using replacement components with higher ratings (voltage, wattage, etc.).

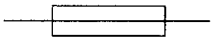
2. Replacement parts having special safety-related characteristics are identified in this manual, and in the schematic diagrams, by the symbol ⚠. These components have values that are of special significance to product safety. Should any component (identified by the symbol ⚠) need to be replaced, use only the part designated in the parts List. Do not deviate from the specified resistance, wattage, and voltage ratings.


AC VOLTMETER
(5000 ohms per volt or more sensitivity)
Reading should not exceed 300 mVrms
Video Recorder
1500 Ohm
10 Watt
AC OUTLET
0.15μF 150 VAC
Place this probe on each exposed metallic part
Good earth ground such as a water pipe,conduit etc.

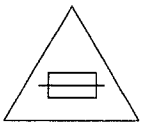
Voltmeter Hook-up for Leakage Current Check

3. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminals, screwheads, metal overlays, etc. to be sure that the set is safe to operate without the danger of electrical shock, Plug the AC line cord directly into a 120 V AC outlet. (Do not use a line isolation transformer during this check.) Use an AC voltmeter with a sensitivity of 5000 ohms per volt (or more) as follows: Connect a 1500 ohms, 10 watt resistor, paralleled by a 0.15 mfd, 150 VAC capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the 1500 ohms resistor and 0.15 mfd capacitor combination. Reverse the AC plug at the AC outlet and repeat the AC voltage measurements for each exposed metallic part. The measured voltage must not exceed 300 mVrms. This corresponds to 200 μA AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

4. Fuse symbol marks.
For CANADA: CSA Standard No. C22.2 No. 1-M1981



For U.S.A.: UL Sub. No. 1409/1492



Fuse rating is marked at adjacent fuse.

UNDERWRITERS LABORATORIES Standard

CAUTION "Risk of fire-replace fuse as marked"

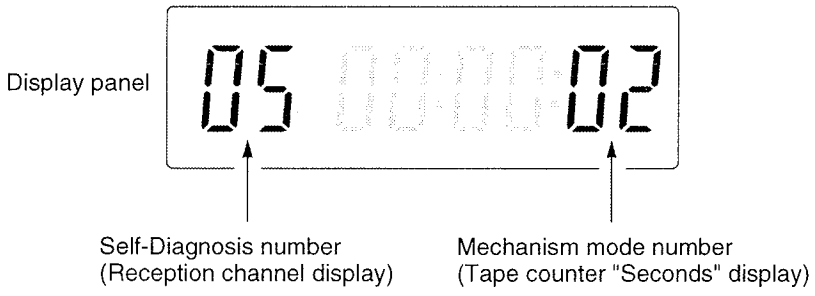
SELF-DIAGNOSIS DISPLAY

Mechanism Mode Display / Head Output Drop Warning Display

This unit displays the diagnosis contents of abnormalities and the mechanism mode on its display panel in 2-digit numbers.
When the head playback output has dropped, the "L" sign will be blinked.
These display shows the outline of the problems. Use it as a reference when servicing the unit.

1. Self-Diagnosis Contents and Mechanism Mode Display

- When the STOP button on the remote control is pressed for about 10 seconds continuously, the self-diagnosis number will be displayed on the reception channel display of the display panel and number indicating the failed mechanism mode (changed mode when being shifted) on the tape counter "seconds" display for 10 seconds each.
- During self-diagnosis display, displays other than the diagnosis number/mechanism mode number will be turned off and when displays end, the normal display will be returned automatically.
- Refer to "Self-Diagnosis Contents" for the self-diagnosis numbers and the "Mechanism Mode Display Contents" for the mechanism mode numbers.
- When the "0" button on the remote control unit is pressed during display, and clearing the self-diagnosis display and mechanism mode display.



Self-Diagnosis Contents

No.	Problem	Main Possible Cause	Mechanism Operations and State After Occurrence
00	There is no abnormality in the mechanism.		
01	The cylinder motor does not rotate.	• The cylinder motor is faulty. • The control of the cylinder motor is faulty. • The tape winds around the cylinder.	Shifts to the STOP mode.
02	The take-up reel does not rotate.	• The take-up reel is caught. • The reel belt is faulty. • The take-up torque has decreased.	Shifts to the STOP mode.
03	The capstan motor does not rotate.	• The capstan motor is faulty. • The control of the capstan motor is faulty.	Shifts to the STOP mode.
04	The tape cannot be loaded with the cassette inserted. (But unloading can be performed.)	• Error in the operations of the tape loading mechanism. • Foreign particles in the tape loading mechanism. • The tape end sensor is faulty. • The reel brake of the tape cassette has not been released.	Unloads, shifts to the INITIAL mode, and the power goes off.
05	Tape loading and unloading cannot be performed with the cassette inserted.	• The tape guide is caught. • The loading motor is faulty. • The control of the loading motor is faulty.	The power is forcibly turned off with the mechanism at its current position.

No.	Problem	Main Possible Cause	Mechanism Operations and State After Occurrence
06	Front unloading cannot be performed when ejecting the cassette. (Front loading can be performed.)	• The cassette drive mechanism is faulty. • The front door is caught.	Front loads and shifts to the STOP or INITIAL mode. • When the power switch is turned on before eject operations: Shifts to the STOP mode. • When the power switch is turned off before eject operations: Shifts to the INITIAL mode and the power goes off.
07	Front loading and front unloading cannot be performed when ejecting the cassette.	• The tape cassette is caught in the cassette drive mechanism. • The main cam and front rack gear of the front loading mechanism have not engaged properly. • The gears of the front loading drive mechanism have not engaged properly.	The power is forcibly turned off with the mechanism at its current position.
08	The mechanism becomes 1 (REVIEW) while moving from 2 (IDLER), 3 (STILL), 4 (BRAKE), and to 5 (STOP).	• The mechanism mode switch contact is faulty.	The power is forcibly turned off with the mechanism at its current position.
09	The mechanism becomes 7 (INITIAL) while moving from 1 (REVIEW), 2 (IDLER), 3 (STILL), 4 (BRAKE), and to 5 (STOP).	• The mechanism mode switch contact is faulty.	Carries out tape take-up operations, shifts to the INITIAL mode, and the power goes off.

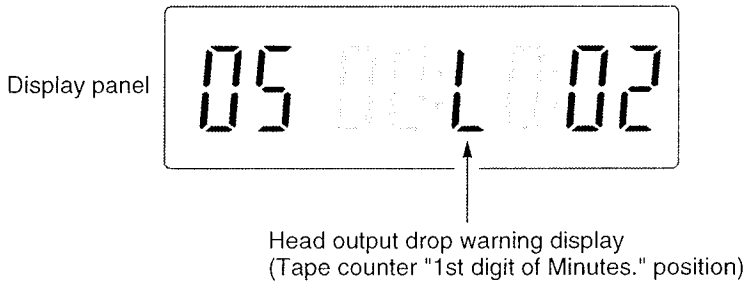
Note: For details of mechanism operations corresponding to the mechanism positions of the self-diagnosis numbers 08 and 09 above, refer to the separate volume on the V95 I mechanism manual. These manual reference numbers are shown in the cover.

Mechanism Mode Display Contents

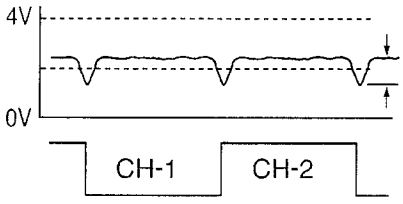
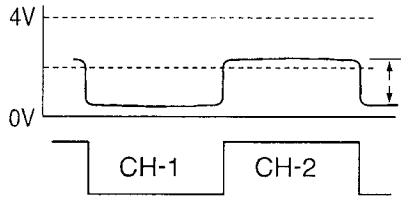
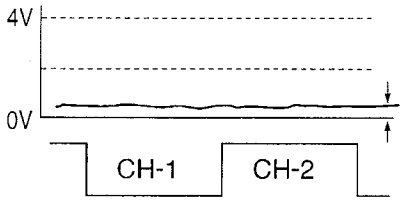
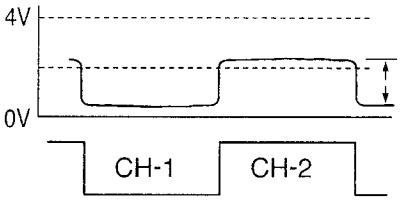
Mode No.	Mechanism Mode	Mode No.	Mechanism Mode	Mode No.	Mechanism Mode
00	CASSETTE OUT	08	PLAY	16	VIDEO INSERT
01	STANDBY	09	REC	17	VIDEO INSERT-PAUSE
02	STOP	10	AUDIO DUBBING	18	AUDIO/VIDEO INSERT
03	STILL	11	X2 SPEED PLAY	19	REVERSE X2 SPEED PLAY
04	REC-PAUSE	12	CUE		
05	AUDIO DUBBING-PAUSE	13	REVIEW		
06	FRAME ADVANCE	14	FAST FORWARD		
07	SLOW	15	REWIND	99	OTHERS

2. Head Output Drop Warning Display

- When the STOP button on the remote control is pressed for 10 seconds continuously 10 seconds after play starts, "L" will be displayed blinking at the first digit of the minutes position on the tape counter when the head output is lower than the specified value to indicate an abnormality.
- The cause of the abnormality may be due to drop in the playback output caused by drop in the efficiency of the cassette used or head clogging. Refer to "Head Playback Output Voltage Check" as a means to judge the abnormality.



Head playback output voltage check

Cassette Used	Warning Display	Envelope Detection Output Voltage	Main Cause
Cassette with normal playback output	–	Envelope detection output (IC301 Pin 25 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-2) 	When the output voltage difference of the two channels is 0.5 to 0.95V • The video heads of both are normal
Recorded cassette (with tabs)	"L" blinking	Envelope detection output (IC301 Pin 25 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-2) 	When the output voltage difference of the two channels is more than 0.95V • Tracking adjustment has not been performed accurately • One video head is clogged • One video head has worn out
	"L" blinking	Envelope detection output (IC301 Pin 25 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-2) 	When the average outputvoltage of the two channels is less than 0.5V • Tracking adjustment has not been performed accurately • Both video heads are clogged • Both video heads have worn out
Rental cassette (without tabs)	"L" blinking	Envelope detection output (IC301 Pin 25 or C3016 HOT side: see Fig. 2-1-1) Switching pulse (TP183: see Fig. 2-1-2) 	When the output voltage difference of the two channels is more than 0.95V • Tracking adjustment has not been performed accurately • One video head is clogged • One video head has worn out
	• Some rental cassettes may have extremely low video playback outputs even when both video heads are normal. As the average output voltage of the two heads may be less than 0.5V for some, no warning displays will be shown.		

1. DISASSEMBLY

1-1. REMOVAL OF CABINET, MECHANISM UNIT, AND MAIN BOARD

REMOVING THE CABINET PARTS (Fig. 1-1-1)

1. Remove the cabinet by removing the four screws ① and two screws ②.
2. Remove the front panel by removing the locks of the clamps (A) using a screwdriver, etc. and slightly rotating the bottom part in the direction of the arrow.

Notes: • Electrical adjustments for the this model can be performed with only the cabinet removed.

REMOVING THE MECHANISM MAIN UNIT AND THE CP-1 PWB ASSEMBLY (Fig. 1-1-2 and 1-1-3)

After removing the cabinet parts, remove the mechanism unit and the CP-1 PWB assembly connected as follows.

1. Spread out the lock clamps (C) in the arrow direction slightly and remove the TM-1 PWB as shown in Fig. 1-1-2.
2. Remove the screw ④ at the chassis.
3. Remove the screw ⑤ in the chassis, the screw ⑥ and the holder in this order.
4. Remove the two screws ⑦ and two screws ⑧ of the mechanism unit. The two screws ⑧ of the cassette tray can be removed easily by pushing the tray lock lever in the arrow direction to remove the lock as shown in the enlarge view A and by pushing the lid opener lever in the arrow direction to remove the lock as shown in the enlarge view B.
5. Lift up the whole mechanism unit and main board (CP-1 PWB assembly), and as shown in Fig. 1-1-3, push the two lock clamps (D) of the chassis in the arrow direction so that they can be removed from the chassis.

M-MA2/U-1

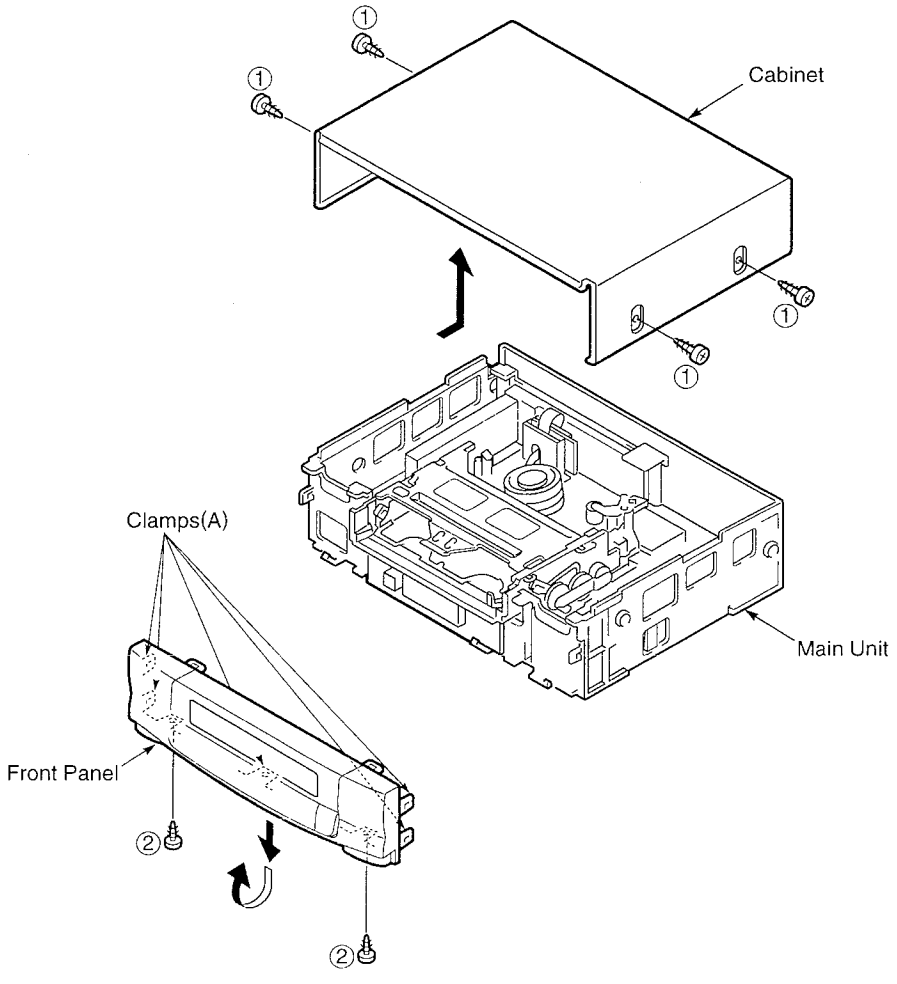


Fig. 1-1-1

M-PF2LN/TA-2

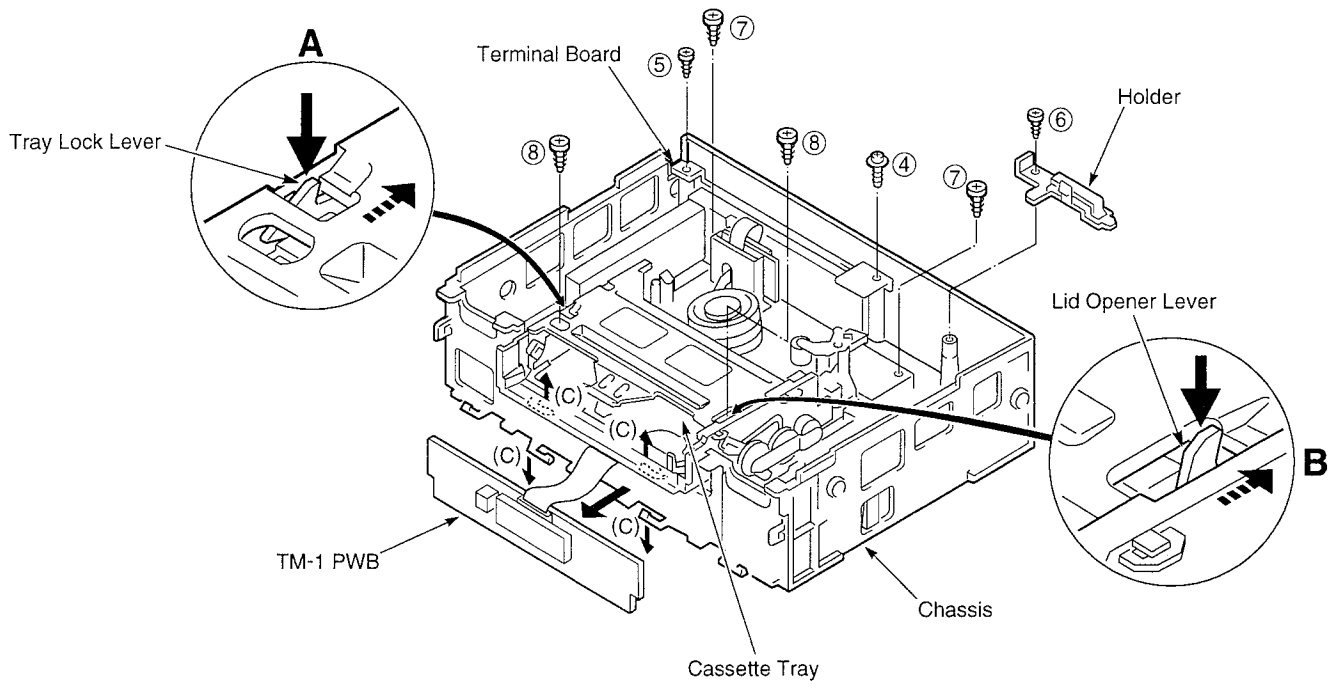


Fig. 1-1-2

M-PF2LN/TA-3

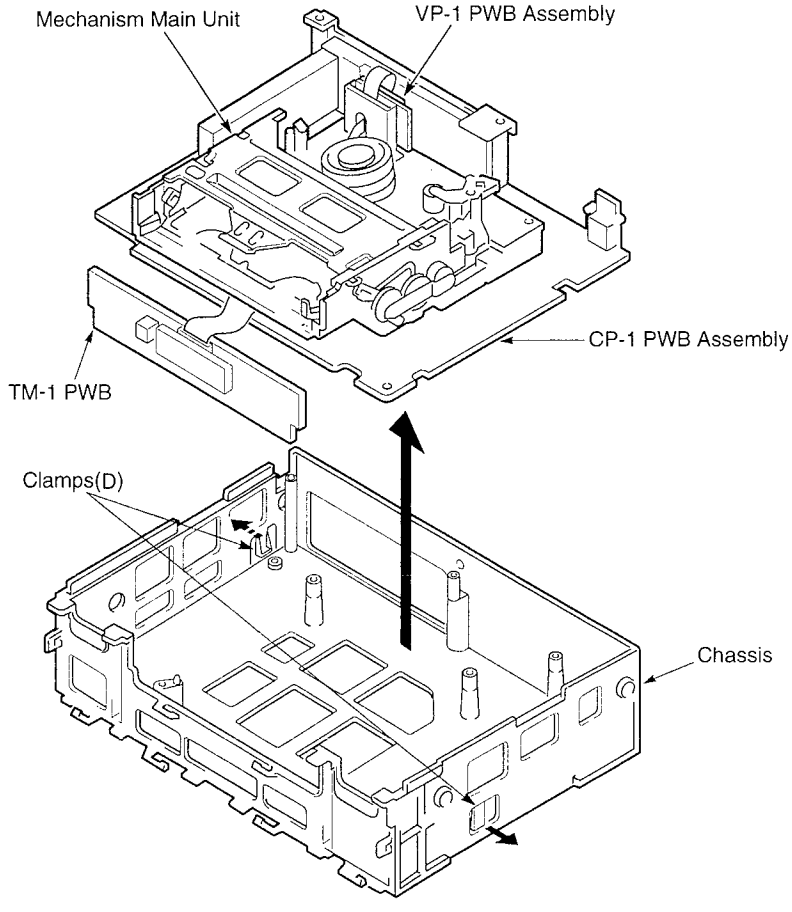


Fig. 1-1-3

1-2. TEMPORARILY SETTING UP AND CONNECTING CP-1 PWB ASSEMBLY

The following is an example of how to place and connect the main board without a jig, when repairing the CP-1 PWB assembly.

1. Place the mechanism unit and main board up side down as a whole on a flat surface with foil side of the main board facing up.
2. Operete the unit using the buttons on TM-1 PWB or the remote control.

M-PF2LN/TA-4

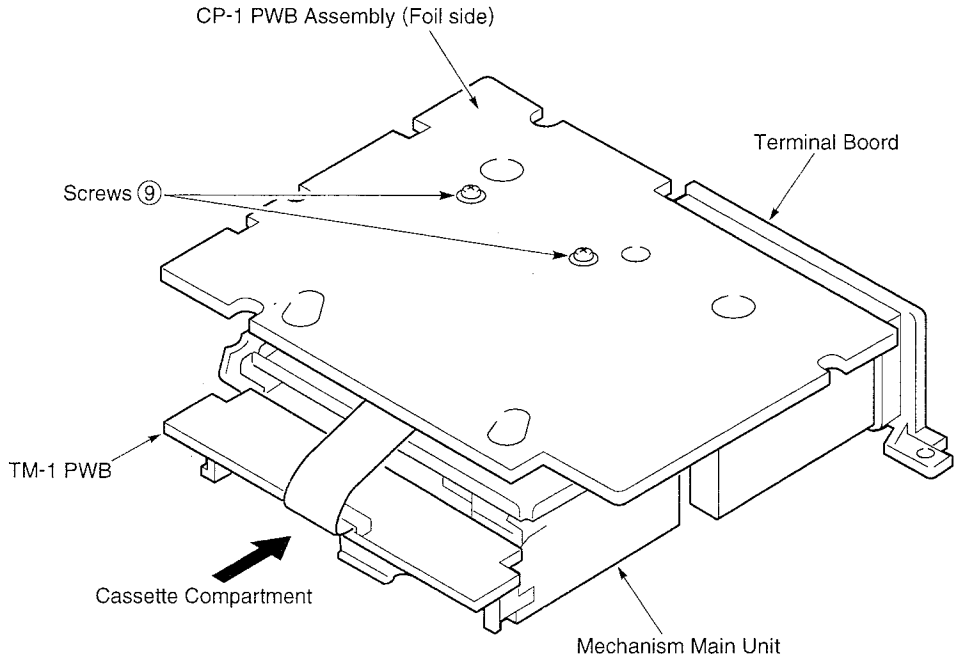


Fig. 1-1-4

1-3. INSTALLATION OF THE FRONT PANEL

When installing the front panel to the chassis after repaires and adjustments.

1. Pressing down the door opener lever of the mechanism main unit.
2. Set the cassette door to half-opened state as shown in Fig. 1-1-5, and install the front panel to the chassis.

Note: Opened cassette door position does not install the front panel to the chassis.

M-PF2LN/TA-5

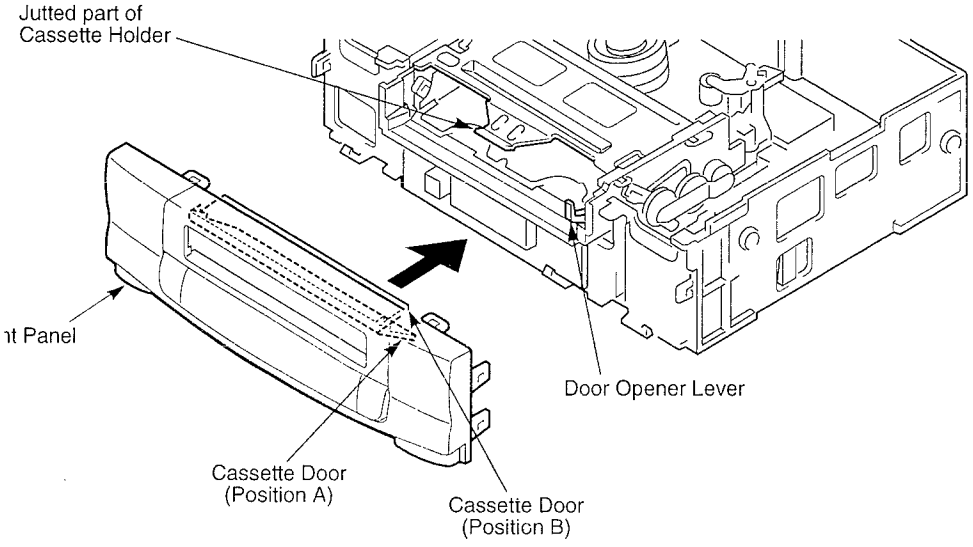
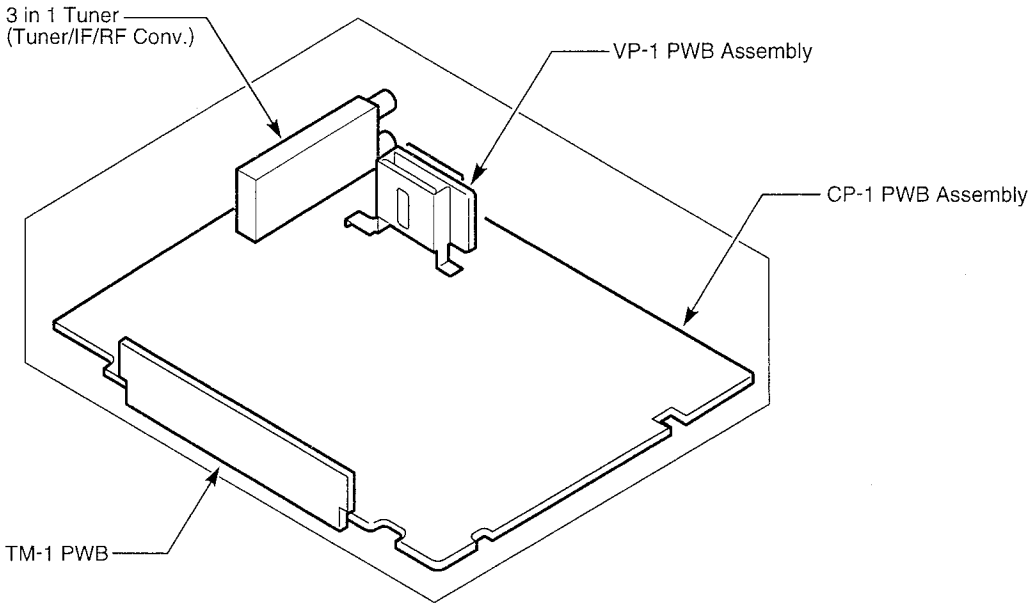


Fig. 1-1-5

1-4. CIRCUIT BOARD LOCATIONS

L-PF2LN/TA



2. ELECTRICAL ADJUSTMENT

VCR INITIAL SETUP

This VCR need initial setup by using the menus displayed on-screen. After the antenna cable connection have been made, then follow steps 1 to 3 to preset the VCR.

1. Turn on the Power, press the VCR button and select the TV/VCR button on the remote control to "VCR", the AUTO SETUP menu appears.
2. Press the SET button on the remote control, the language select menu appears, select the language of use.
3. Press the program button on the remote control to erase the main menu.

When steps 1 to 3 have been finish, ready to operate the all operating mode.

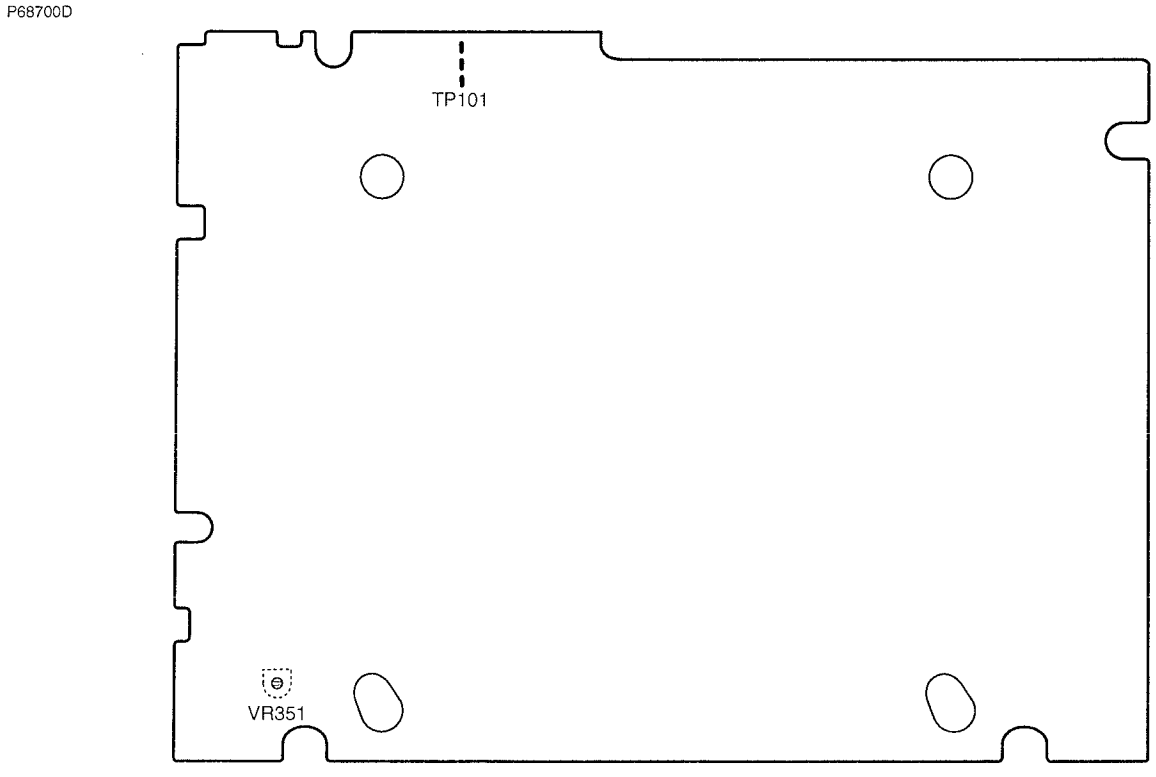
2-1. SERVO CIRCUIT ADJUSTMENT

- These adjustments should be done upon completion of the tape transport adjustments.
- If the tape transport adjustments (except the tilt adjustments) are carried out after these adjustments, follow the procedures again in section 2-1-3, "Switching position adj."
- When a cassette tape is loaded, auto-tracking will be set immediately after starting the first playback. As this will deviate the tracking center set, be sure to press the channel buttons ▲ or ▼ once directly after starting playback to prevent auto-tracking from being set.

2-1-1. TEST EQUIPMENT AND STANDARDS REQUIRED

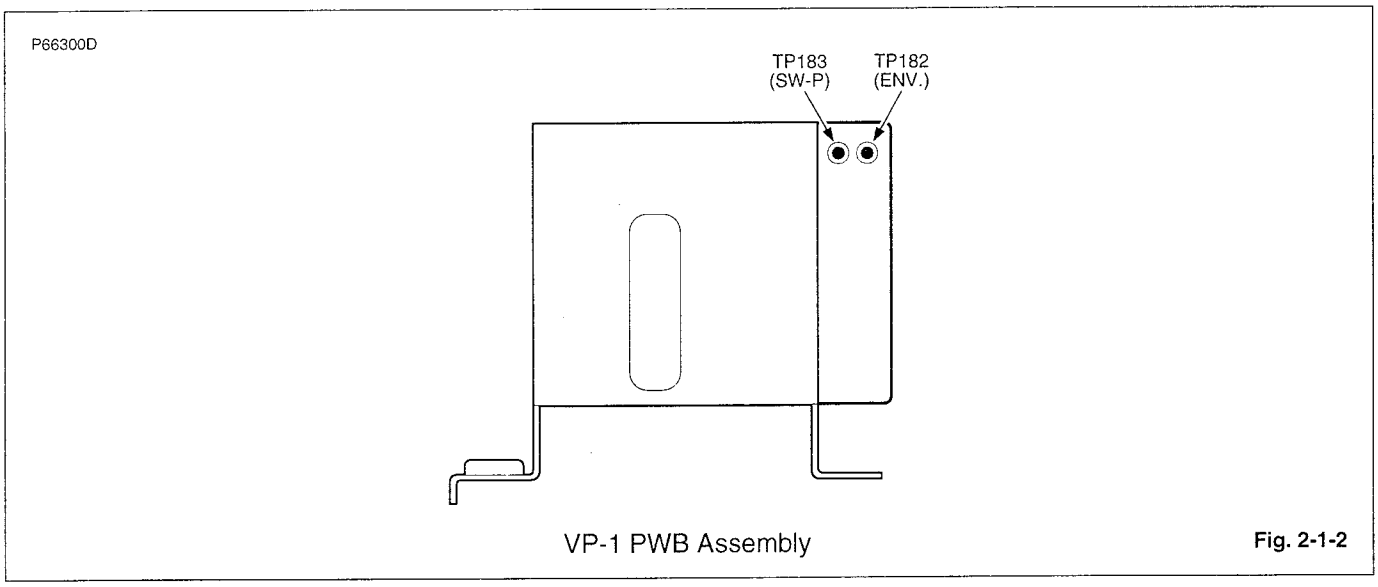
Oscilloscope	Vertical sensitivity Bandwidth	: 5 mV/DIV, external trigger : more than 10 MHz
Alignment Tape	VHJ-0006 (NM-S7)	: SP mode, monoscope, 7 KHz
Blank Tape	VHS-type cassette tape	
Monitor TV		

2-1-2. LOCATION OF ADJUSTMENT POINTS



CP-1 PWB (Foil side)

Fig. 2-1-1



VP-1 PWB Assembly

Fig. 2-1-2

Note:

- CHANNEL button also servers as a TRACKING button.

2-1-3. SWITCHING POSITION ADJ.

Measuring Point	Measuring Equipment	Adj. Condition
TP101 (VIDEO OUT) TP183 (SW-P)	Oscilloscope	PLAY (SP) mode Alignment tape VHJ-0006 (NM-7)

Adj. Location	Adj. Value
VR351 (SW-P)	6.5 H ± 0.5 H

1. Play back the alignment tape.
2. Set the tracking control position to the center by pressing CHANNEL buttons ▲ and ▼ simultaneously.
3. Adjust VR351 (SW-P) so that the width of "T" becomes 6.5 H ± 0.5 H as shown in Fig. 2-1-3.

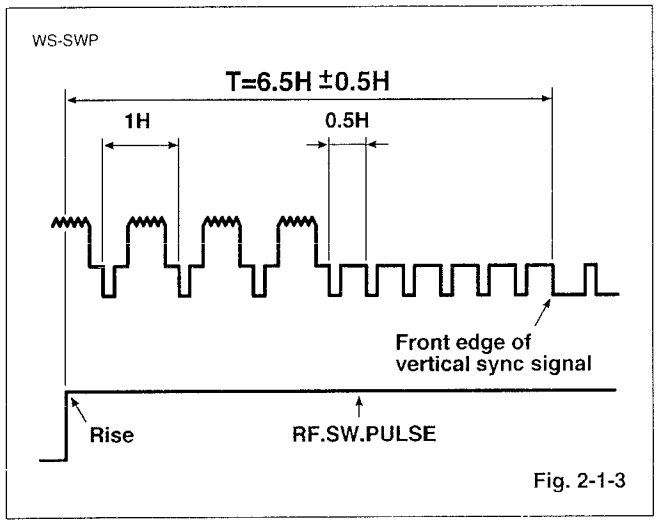


Fig. 2-1-3

REPAIR RELAY JIG

Connect the flat cable end from the cylinder assembly to the VP-1 PWB assembly using the relay jig to provide simple repairing of the VP-1 PWB assembly, as shown in Fig.2-1-4. Further, when repairing the VP-1 PWB assembly, be sure to make contact an end of shield case with bracket of the VP1 PWB assembly to maintain the shield effect. If the VP-1 PWB assembly does not contact, there is insufficient ground and no proper play back image can be obtained.

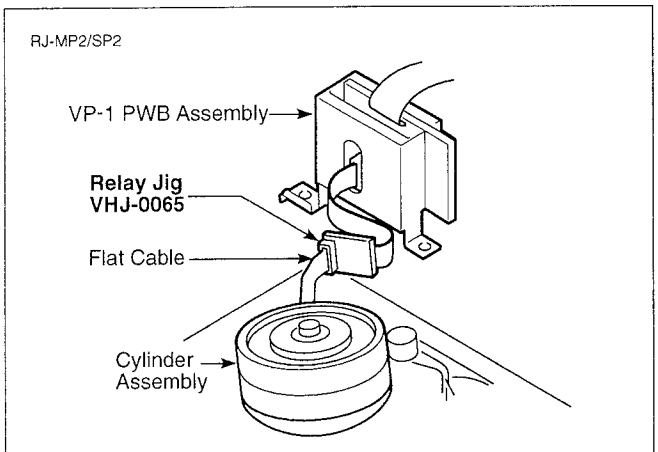


Fig. 2-1-4

2-2. IF (RF AGC) CIRCUIT ADJUSTMENT

- In this model, the circuits of the TUNER, IF and RF converter have been made into one. Therefore, should one circuit malfunction, the whole unit must be replaced.
- The adjustments for the IF (RF AGC) circuit of the 3 in 1 tuner is described below.

Note: The 3 in tuner dose not need any adjustments, because precise adjustments were down before shipment.

2-2-1. TEST EQUIPMENT AND STANDARDS REQUIRED

Monitor TV	

2-2-2. LOCATION OF ADJUSTMENT POINT

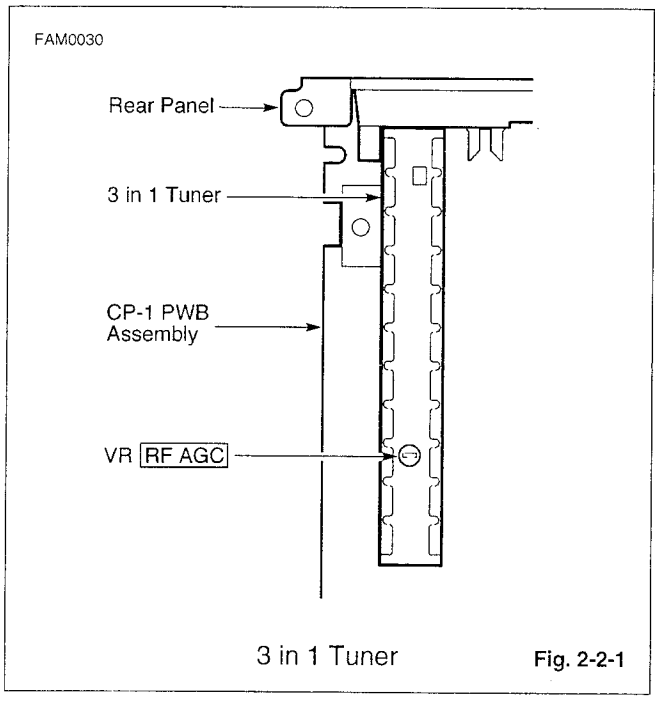


Fig. 2-2-1

2-2-3. RF AGC ADJ.

Measuring Point	Measuring Equipment	Adj. Condition
Picture of monitor TV	Monitor TV	E-E mode
Adj. Location		**Adj. Value**
VR (RF AGC) (on the 3 in 1 tuner)		S/N is best point

1. Connect the monitor TV to VHF/UHF antenna output terminal.
2. Connect the VHF antenna to VHF/UHF input terminal.
3. Receive the middle electrical field (70dBμ ~ 90dBμ) of the VHF high channel, and slowly turn the VR (RF AGC) from the point where snow-noise is present to the point where it just disappears from the monitor TV.
4. Confirm by monitor TV that there is no beat and saturation (S/N is best point) when receiving any TV channel.

3. TEST POINTS FOR TAPE PATH ADJUSTMENT

Test points TP182 (ENV) and TP183 (SW-P) for tape path adjustment are shown in figure below.
For adjustment, refer to the separate volume "V95 I Mechanism Manual" (MM531433) and "V95 II Mechanism Manual" (MS531500).

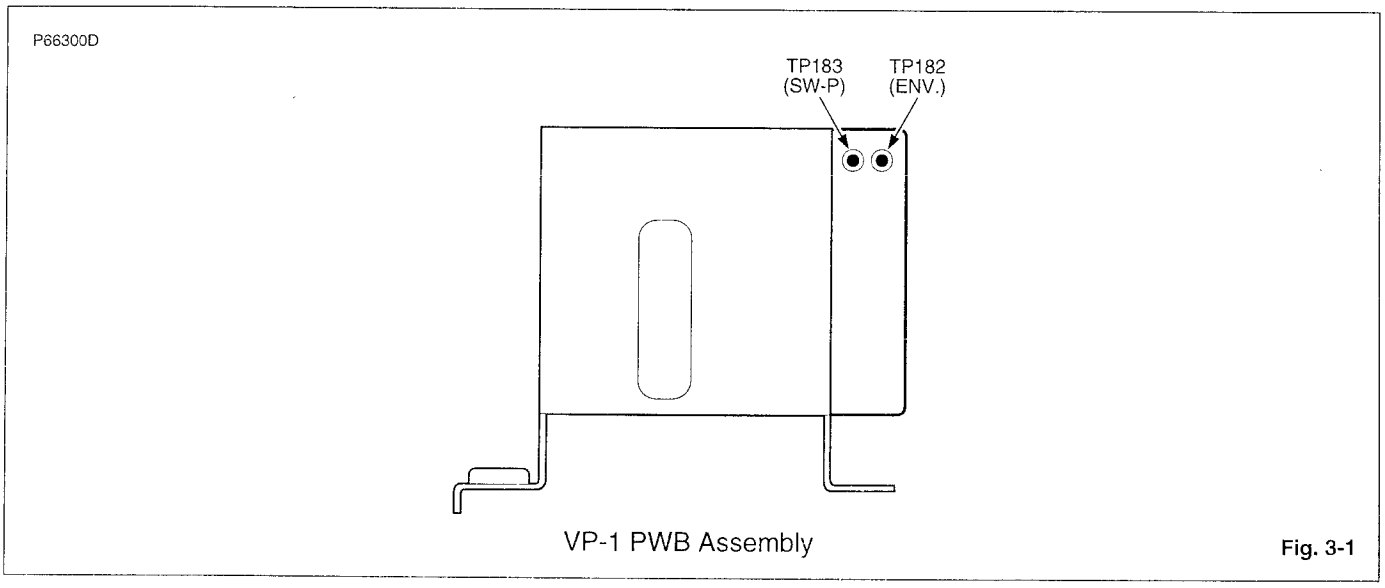


Fig. 3-1

4. PARTS LIST

LOCATION		PARTS NO.	DESCRIPTION

ACCESSORIES

		645 021 5865	REMOCON,INFRARED,WITH REMOCON
OR		613 169 4385	COVER,BATTERY,FOR REMOCON
		613 174 2970	INSTRUCTION MANUAL,VWM-260 ONLY
OR		613 176 8086	INSTRUCTION MANUAL,VHR-M13 ONLY
		645 022 0333	CABLE,ANT NTSC
OR		645 017 2298	CABLE,ANT NTSC
OR		621 006 9240	CONNECTOR CABLE 75
	⚠	645 003 2851	CORD,POWER,VWM-260 ONLY
OR	⚠	613 152 1032	CORD,POWER,VWM-260 ONLY
OR	⚠	645 019 2630	CORD,POWER,VWM-260 ONLY
OR	⚠	645 005 1005	CORD,POWER,VWM-260 ONLY
OR	⚠	645 003 2851	CORD,POWER,VHR-M13 ONLY
OR	⚠	613 152 1049	CORD,POWER,VHR-M13 ONLY
OR	⚠	645 019 2630	CORD,POWER,VHR-M13 ONLY

PACKING MATERIALS

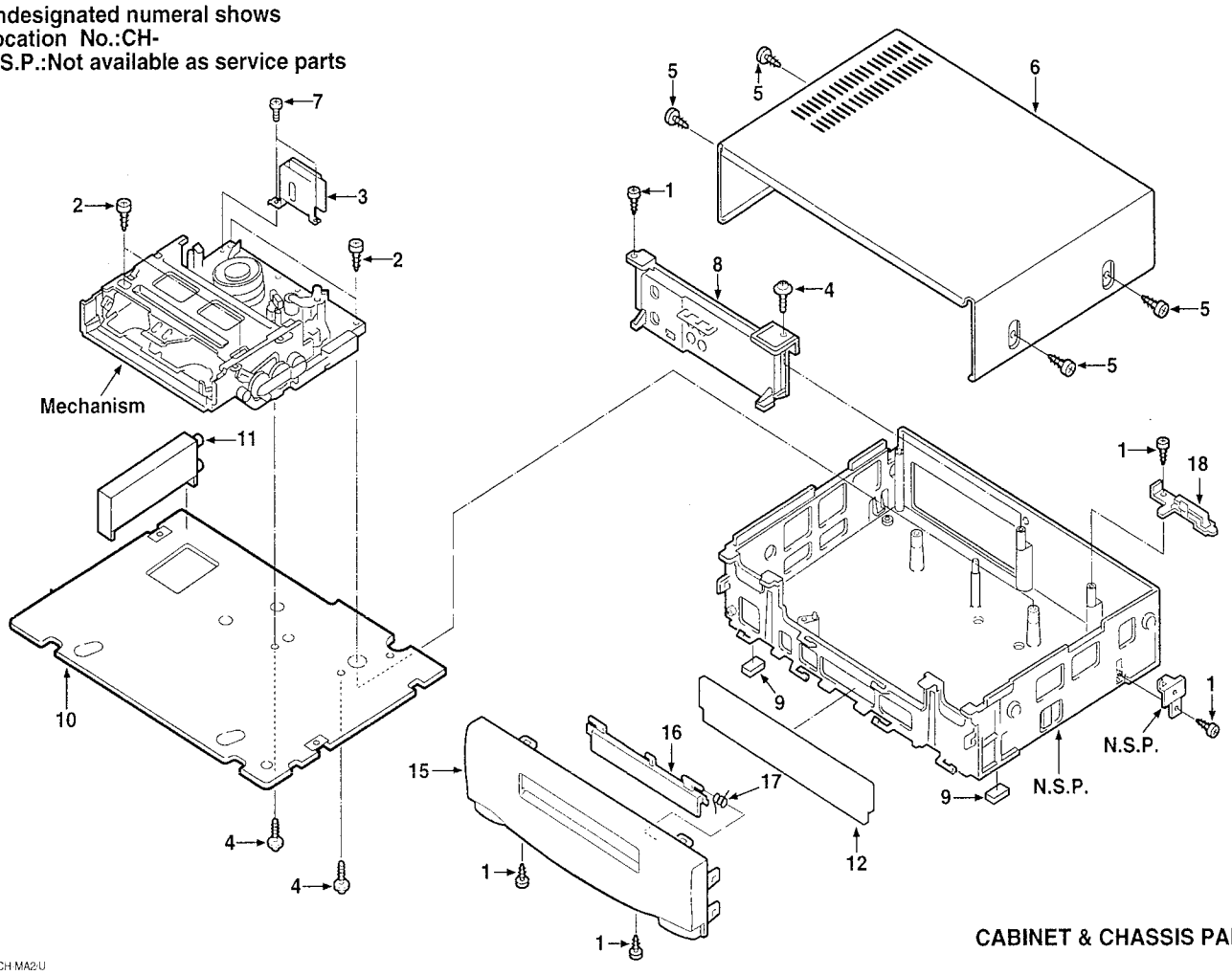
	613 174 5629	CARTON CASE,VWM-260 ONLY
OR	613 176 8079	CARTON CASE,VHR-M13 ONLY
	613 172 1685	CUSHION, FRONT,VHR-M13 ONLY
OR	613 172 8226	CUSHION, FRONT,VWM-260 ONLY
	613 172 1692	CUSHION, BACK,VHR-M13 ONLY
OR	613 172 8233	CUSHION, BACK,VWM-260 ONLY
	613 133 5943	POLYE COVER,INNER-K

LOCATION	PARTS NO.	DESCRIPTION

CABINET & CHASSIS PARTS

CH-1	411 137 0007	SCR L-TPG BIN 3X10
CH-2	411 021 7907	SCR S-TPG BIN 4X12
CH-3	613 174 6848	COMPL PWB,VP-1(N.S.P)
CH-4	412 052 5108	SPECIAL SCREW-2.6X12
CH-5	412 028 9406	SPECIAL SCREW
CH-6	613 173 1844	COMPL,COVER TOP,VWM-260 ONLY
OR	613 173 0632	COVER TOP
CH-7	411 001 1901	SCR S-TPG BIN 3X6
CH-8	613 161 2655	TERMINAL
CH-9	613 121 1001	STAND,FELT,(FRONT)
CH-10	613 176 6815	COMPL PWB,CP-1-A(N.S.P),VHR-M13 ONLY
OR	613 174 5193	COMPL PWB,CP-1-A(N.S.P),VWM-260 ONLY
CH-11	645 018 8626	TUNER,RF/TU/IF
OR	645 020 9031	TUNER,RF/TU/IF
CH-12	613 173 7228	COMPL PWB,TM-1(N.S.P),VHR-M13 ONLY
OR	613 173 2872	COMPL PWB,TM-1(N.S.P),VWM-260 ONLY
CH-15	613 176 7966	ASSY,CABINET FRONT,VHR-M13 ONLY
OR	613 174 5322	ASSY,CABINET FRONT,VWM-260 ONLY
CH-16	613 174 5476	DOOR CASSETTE,VWM-260 ONLY
OR	613 176 8055	DOOR CASSETTE,VHR-M13 ONLY
CH-17	613 153 0478	SPRING
CH-18	613 160 2885	HOLDER

Undesignated numeral shows Location No.:CH-
N.S.P.:Not available as service parts



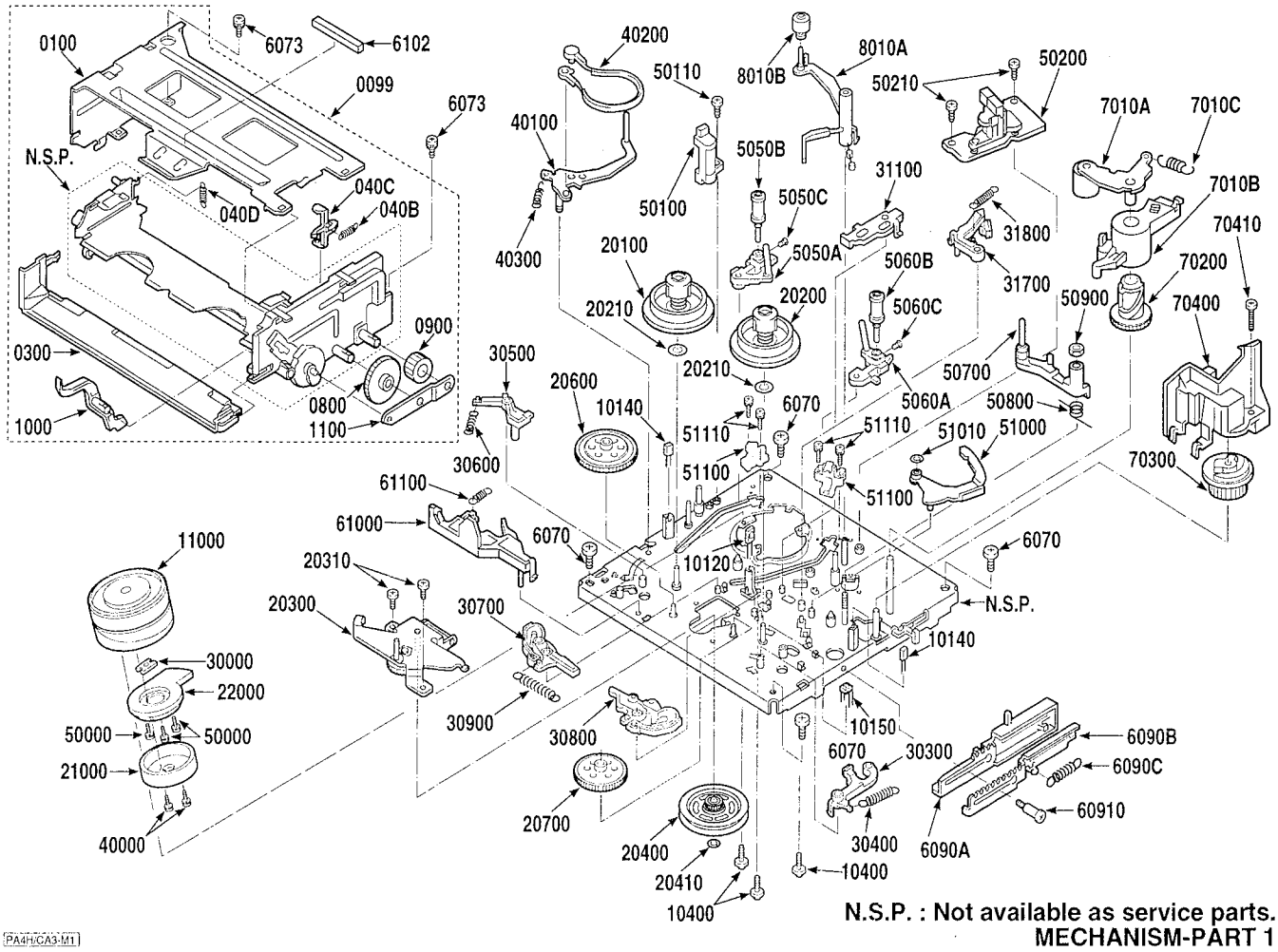
CABINET & CHASSIS PARTS

*CH-MA2/U

MECHANISM PARTS

MECHANISM PARTS 1

LOCATION	PARTS NO.	DESCRIPTION
11000	613 160 3400	ASSY,CYLINDER,2N2N-2 (Do not disassemble "ASSY,CYLINDER")
21000	645 015 7875	MOTOR,ROTOR,CYL DC 2W
22000	645 015 7868	MOTOR,STATOR,CYL DC 2W
30000	613 107 0509	SPACER,MOTOR
40000	412 036 5001	SPECIAL SCREW 2.3X6
50000	412 036 4905	SPECIAL SCREW 2.3X10
6073	412 048 8205	SPECIAL SCREW-2.6X6
6102	613 151 6618	PAD
0099	613 152 0578	COMPL,CASSETTE MECHANISM
0100	613 152 0738	STAND,L
0300	613 152 0660	FRAME,UNDER
040B	613 152 0417	SPRING,LID OPENER
040C	613 152 0707	LEVER,RELEASE
040D	613 152 0424	SPRING,TRAY LOCK
0800	613 152 2794	GEAR,LOCK
0900	613 152 2800	GEAR,PINION
1000	613 151 9480	LEVER,DOOR OPENER
1100	613 151 9299	HOLDER,GEAR
6070	411 021 7907	SCR S-TPG BIN 4X12
10120	407 162 1102	LED LN59L (D8003)
10140	407 162 8705	PHOTO DIODE PN263L-(NC)(D8003)
10150	407 165 8108	PHOTO COUPLE SG-105F(PC801)
OR	407 043 0101	PHOTO DIODE ON2170-R(PC801)
10400	412 052 6204	SPECIAL SCREW-2.6X5.5
20100	613 160 5503	ASSY,REEL SUPPLY
OR	613 169 0974	REEL,SUPPLY
20200	613 160 4193	ASSY,REEL TAKE UP
OR	613 168 1514	ASSY,REEL TAKE UP
20210	412 015 8900	SPECIAL WASHER 3.1X6X0.4
OR	412 021 5306	SPECIAL WASHER 3.1X6X0.3
OR	412 015 8504	SPECIAL WASHER 3.1X6X0.5
20300	613 175 0661	COMPL,MOUNTING CLUTCH
20300	613 171 6896	COMPL,MOUNTING CLUTCH
20310	412 048 7505	SPECIAL SCREW-2.6X4
20400	613 151 9701	PULLEY,REEL
20410	412 045 4606	SPECIAL WASHER 2.4X6X0.25
20600	613 152 2749	GEAR,REEL S
20700	613 152 2756	GEAR,REEL T
30300	613 160 3356	ASSY,BRAKE SOFT T
30400	613 152 0295	SPRING,SOFT T
30500	613 151 9411	LEVER,SOFT S
30600	613 152 0318	SPRING,SOFT S
30700	613 160 6166	ASSY,BRAKE,S
30800	613 159 2193	ASSY,BRAKE T
30900	613 163 6996	SPRING,BRAKE
31100	613 152 0189	SLIDE,ACT BRAKE T
31700	613 151 8490	ASSY,BRAKE CAPSTAN
31800	613 152 0356	SPRING,BRAKE CAPSTAN
40100	613 151 8759	ASSY,LEVER,BT
40200	613 160 5282	ASSY,BRAKE,BAND
40300	613 152 0271	SPRING,BT
50100	645 017 6432	HEAD,ERASE FULL
50110	412 048 9707	SPECIAL SCREW-2.6X10
50200	613 177 1833	ASSY,HEAD R/P ACE,VHR-M13 ONLY
OR	613 176 8406	ASSY,HEAD R/P ACE,VWM-260 ONLY
50210	412 052 3500	SPECIAL SCREW 2.6X12
5050A	613 164 7237	ASSY,MOUNTING,INCLINE S
5050B	613 022 0233	ASSY,GUIDE,ROLLER
5050C	412 048 4504	SPECIAL SCREW-2X3
5060A	613 164 7251	ASSY,MOUNTING,INCLINE T
5060B	613 022 0233	ASSY,GUIDE,ROLLER
5060C	412 048 4504	SPECIAL SCREW-2X3
50700	613 164 4762	ASSY,LEVER,LOAD
50800	613 152 0387	SPRING,LEVER L GUIDE
50900	412 048 8908	SPECIAL NUT-3X3
51000	613 173 6153	ASSY,LEVER,ACT L GUIDE



N.S.P. : Not available as service parts.

MECHANISM-PART 1

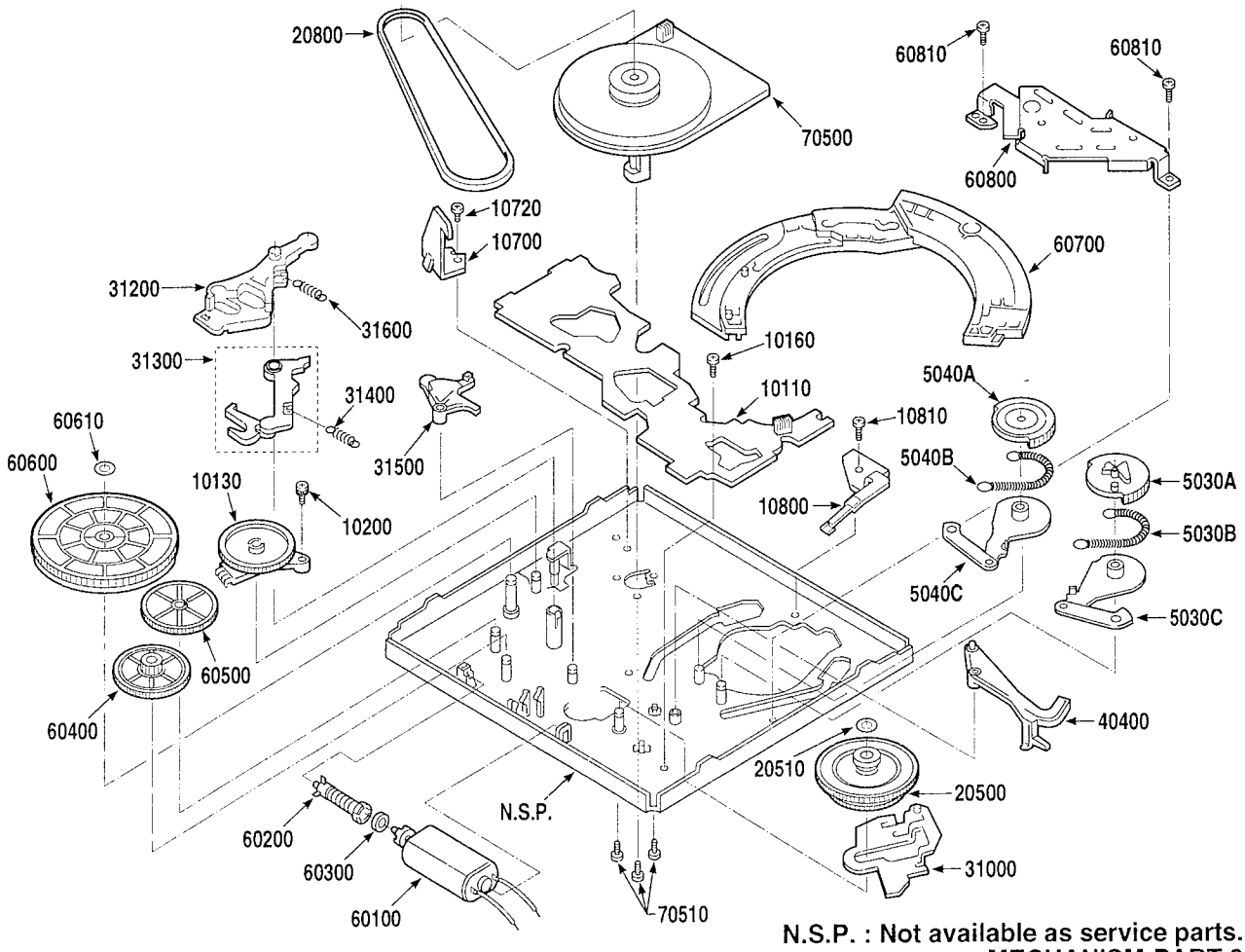
PA4H/CA3-M1

LOCATION	PARTS NO.	DESCRIPTION
51000	613 161 2365	ASSY,LEVER,ACT L GUIDE
51010	412 033 4106	WASHER SLIT 2.6X5X0.50
51100	613 160 7057	MOUNTING,CATCHER
51110	412 049 1700	SPECIAL SCREW-2.6X10
6090A	613 151 9152	GEAR,RACK FRONT
OR	613 160 4636	GEAR,RACK FRONT
6090B	613 151 9114	GEAR,RACK START
6090C	613 152 0226	SPRING,RACK FRONT
60910	412 050 2802	SPECIAL SCREW-2.6X6
61000	613 151 9398	LEVER,EP SW
61100	613 152 3692	SPRING,EP SW
7010A	613 151 8803	ASSY,LEVER,PINCH ROLLER
OR	613 175 1194	ASSY,LEVER,PINCH ROLLER
7010B	613 171 0221	MOUNTING,LIFT PINCH
7010C	613 152 0233	SPRING,PINCH ROLLER
70200	613 156 3841	CAM,LIFT PINCH
70300	613 152 0677	GEAR,CAM PINCH
70400	613 152 0714	MOUNTING,OPENER
70410	412 049 1106	SPECIAL SCREW-2.6X16
8010A	613 171 9606	LEVER,CLEANER
8010B	613 171 9439	ASSY,MOUNTING CLEANER

MECHANISM PARTS 2

10110	613 173 9451	COMPL PWB,MC-1(N.S.P)
10130	645 007 1560	SWITCH,MODE(S8001)
10160	412 048 7505	SPECIAL SCREW-2.6X4
10200	412 048 8304	SPECIAL SCREW-2.6X8
10700	613 167 5926	MOUNTING CAPSTAN
10720	412 048 8007	SPECIAL SCREW-2.6X6
10800	613 160 4179	ASSY,EARTH CYL

LOCATION	PARTS NO.	DESCRIPTION
10800	613 165 8523	ASSY,EARTH CYL
10810	412 048 8007	SPECIAL SCREW-2.6X6
20500	613 160 4186	ASSY,GEAR,FRICTION
20510	411 109 1605	WASHER Y 2.6X6X0.25
20800	613 151 9039	BELT,REEL
31000	613 152 0165	SLIDE,ACT BRAKE S
31200	613 159 0991	LEVER,CONTROL BRAKE
31300	613 159 0847	COMPL,LEVER,ACT BRAKE
31400	613 152 0332	SPRING,RETURN BRAKE
31500	613 151 9459	LEVER,CHANGE CLUTCH
31600	613 152 0349	SPRING,CHANGE CLUTCH
40400	613 153 7583	ASSY,LEVER SPRING BT
5030A	613 152 2763	GEAR,LOAD S
5030B	613 152 0370	SPRING,LOAD S
5030C	613 160 3691	ASSY,LEVER,LOAD S
5040A	613 152 2770	GEAR,LOAD T
5040B	613 152 0363	SPRING,LOAD T
5040C	613 160 3707	ASSY,LEVER,LOAD T
60100	645 003 4305	ASSY,MOTOR LOADING
60200	613 151 8599	COMPL,GEAR,WORM
60300	613 151 9107	DAMPER
60400	613 151 9138	GEAR,WHEEL 1
60500	613 160 3790	GEAR,WHEEL 2
60600	613 156 4008	CAM,MAIN
60610	412 054 6806	SPECIAL WASHER 3.6X0.5
60700	613 159 9017	SLIDE,CRESCENT
60800	613 159 8997	MOUNTING,CRESCENT
60810	412 048 8007	SPECIAL SCREW-2.6X6
70500	645 008 1897	MOTOR,CAPSTAN DC 3W
OR	645 020 9123	MOTOR,CAPSTAN DC 3W
70510	412 048 7604	SPECIAL SCREW-2.6X6



N.S.P. : Not available as service parts.

MECHANISM-PART 2

MA4/U4-M2

ELECTRICAL PARTS

Note:

1. Materials of Capacitors and Resistors are abbreviated as follows ;

Resistors		Capacitors	
MT-FILM	Metallized Film Resistor	MT-POLYEST	Metallized Polyester Capacitor
MT-GLAZE	Metallized Glaze Resistor	MT-COMPO	Metallized Composite Capacitor
OXIDE-MT	Oxide Metallized Film Resistor	TA-SOLD	Tantalum Solid Capacitor
		AL-SOLID	Aluminum Solid Capacitor
		NP-ELECT	Non-Polarized Electrolytic Capacitor
		OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
		DL-ELECT	Double Layered Electrolytic Capacitor

2. Tolerance of Capacitor (10pF over) and Resistor are noted with follow symboles.
   F .....1% G .....2% J .....5% K 10%
   M .....20% N .....30% Z .....+80% - -20%
3. Capacitors
   U : μF P : pF
4. Inductors
   UH : μH MH : mH
5. N.S.P. : Not available as service parts.

LOCATION	PARTS NO.	DESCRIPTION
COMPL PWB,CP-1-A(N.S.P)		
	613 176 6815	VHR-M13 ONLY
	613 174 5193	VWM-260 ONLY
	(SEMICONDUCTORS)	
Q1025	405 015 8704	TR 2SC2812-L6
OR	405 014 4608	TR 2SC2412K-S
OR	405 015 8407	TR 2SC2812-L5
OR	405 014 4509	TR 2SC2412K-R
Q1050	405 015 8407	TR 2SC2812-L5
OR	405 014 4509	TR 2SC2412K-R
OR	405 014 4608	TR 2SC2412K-S
OR	405 015 8704	TR 2SC2812-L6
Q1103	405 002 6706	TR 2SA1179-M6
OR	405 002 0407	TR 2SA1037K-S
OR	405 002 6508	TR 2SA1179-M5
OR	405 002 0308	TR 2SA1037K-R
Q1107	405 015 9701	TR 2SC2814-F4
OR	405 035 6100	TR 2SC2413K-Q
OR	405 015 9909	TR 2SC2814-F5
Q1201	405 013 7006	TR 2SC2274-F
OR	405 013 6801	TR 2SC2274-E
Q1301	405 002 0308	TR 2SA1037K-R
OR	405 002 0407	TR 2SA1037K-S
OR	405 002 6706	TR 2SA1179-M6
OR	405 002 6508	TR 2SA1179-M5
Q1302	405 015 9701	TR 2SC2814-F4
OR	405 015 9909	TR 2SC2814-F5
OR	405 035 6100	TR 2SC2413K-Q
Q1451	405 002 0407	TR 2SA1037K-S
OR	405 002 6508	TR 2SA1179-M5
OR	405 002 0308	TR 2SA1037K-R
OR	405 002 6706	TR 2SA1179-M6
Q1452	405 000 2908	TR DTC114EK
OR	405 018 2402	TR 2SC3398
Q2021	405 018 0101	TR 2SC3331-T
OR	405 018 0200	TR 2SC3331-U
OR	405 018 0002	TR 2SC3331-S
Q2022	405 024 9907	TR 2SD734-F
OR	405 024 9709	TR 2SD734-E
Q2023	405 003 5807	TR 2SA1318-U
OR	405 003 5708	TR 2SA1318-T
OR	405 003 5609	TR 2SA1318-S
Q2024	405 018 0101	TR 2SC3331-T
OR	405 018 0200	TR 2SC3331-U
OR	405 018 0002	TR 2SC3331-S
Q2025	405 018 0101	TR 2SC3331-T
OR	405 018 0002	TR 2SC3331-S
OR	405 018 0200	TR 2SC3331-U
Q2029	405 029 3504	TR DTC144EK
OR	405 018 1900	TR 2SC3395
Q2311	405 083 5209	TR DTC343TK,VWM-260 ONLY
Q2313	405 000 2007	TR DTA144EK,VWM-260 ONLY
OR	405 003 7108	TR 2SA1341,VWM-260 ONLY
Q3501	405 013 7006	TR 2SC2274-F

LOCATION	PARTS NO.	DESCRIPTION
Q3501	405 013 6801	TR 2SC2274-E
Q3507	405 014 4608	TR 2SC2412K-S
OR	405 014 4509	TR 2SC2412K-R
Q3561	405 029 3504	TR DTC144EK
Q5001	405 126 0208	TR 2SK1460LS,VHR-M13 ONLY
Q5002	405 013 7006	TR 2SC2274-F
OR	405 013 7303	TR 2SC2274K-F
Q5003	405 006 6702	TR 2SA984-F
OR	405 006 7204	TR 2SA984K-F
Q5004	405 013 7006	TR 2SC2274-F
OR	405 013 7303	TR 2SC2274K-F
Q5020	405 132 7505	TR 2SK2434,VWM-260 ONLY
Q5102	405 089 2202	TR 2SC4483-T
OR	405 089 2103	TR 2SC4483-S
Q5103	405 089 2202	TR 2SC4483-T,VWM-260 ONLY
OR	405 089 2103	TR 2SC4483-S,VWM-260 ONLY
OR	405 125 3200	TR 2SC5070,VHR-M13 ONLY
Q5104	405 014 4608	TR 2SC2412K-S
OR	405 014 4509	TR 2SC2412K-R
Q5105	405 000 0508	TR DTA114ES
Q5106	405 029 3504	TR DTC144EK
Q6001	405 014 4608	TR 2SC2412K-S
OR	405 015 8407	TR 2SC2812-L5
OR	405 014 4509	TR 2SC2412K-R
OR	405 015 8704	TR 2SC2812-L6
	(INTEGRATED CIRCUITS)	
IC101	410 262 0807	IC LA71010ML-MPB
IC110	409 371 7302	IC LC89962
IC150	409 346 0307	IC LC74723-9071
IC301	410 281 5302	IC LC866732A-5D72
IC302	409 314 2005	IC LB1643
IC303	409 243 4101	IC MN1380-L
OR	409 313 0903	IC MN1381-L
IC351	409 348 6505	IC XLU2893K
IC511	409 180 2307	IC UPC1093J
OR	409 067 7203	IC L5431
	(DIODES)	
D1031	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D1201	407 063 8903	ZENER DIODE MTZJ5.6C
D3004	407 012 4406	DIODE 1SS133,VHR-M13 ONLY
OR	407 078 2705	DIODE 1SS244,VWM-260 ONLY
D3005	407 012 4406	DIODE 1SS133
D3107	407 012 4406	DIODE 1SS133,VHR-M13 ONLY
D3110	407 012 4406	DIODE 1SS133
D3111	407 012 4406	DIODE 1SS133
D3112	407 012 4406	DIODE 1SS133
D3501	407 063 8903	ZENER DIODE MTZJ5.6C
D3502	407 012 4406	DIODE 1SS133
D5001	407 197 6509	DIODE DB155G-S,VWM-260 ONLY
OR	407 104 5304	DIODE S1WB(A)60
OR	407 197 6509	DIODE DB155G-S,VHR-M13 ONLY
OR	407 197 6400	DIODE DB154G-S,VWM-260 ONLY
D5003	407 078 2705	DIODE 1SS244
D5004	407 099 9004	ZENER DIODE MTZJ27A,VHR-M13 ONLY
OR	407 078 2705	DIODE 1SS244,VWM-260 ONLY

LOCATION	PARTS NO.	DESCRIPTION
D5006	407 078 2705	DIODE 1SS244
D5010	407 091 6704	DIODE AP01C,VHR-M13 ONLY
D5013 ⚠	407 149 8209	PHOTO COUPLE PS2501-1M
OR ⚠	407 149 9404	PHOTO COUPLE PS2501-1D
D5101	407 169 5707	DIODE RL2Z-LF-C4
OR	407 160 9308	DIODE ERB93-02L3
D5104	407 169 5707	DIODE RL2Z-LF-C4
OR	407 198 2500	DIODE SF24
OR	407 160 9308	DIODE ERB93-02L3
D5105	407 091 6902	DIODE ERA38-04
OR	407 198 2401	DIODE SFT14
D5106	407 078 2705	DIODE 1SS244
D5107	407 091 6902	DIODE ERA38-04
OR	407 198 2401	DIODE SFT14
D5108	407 063 8903	ZENER DIODE MTZJ5.6C
D5109	407 063 8903	ZENER DIODE MTZJ5.6C
D5115	407 091 6902	DIODE ERA38-04
D5116	407 091 6902	DIODE ERA38-04
D5120	407 005 8701	DIODE ERA15-02,VHR-M13 ONLY
OR	407 004 9709	DIODE DSK10C,VHR-M13 ONLY
D6001	407 007 9904	DIODE GMA01
OR	407 012 4406	DIODE 1SS133
D6007	407 099 9905	ZENER DIODE MTZJ33B
	(CRYSTAL DEVICES)	
X1001	645 002 4245	OSC,CRYSTAL 3.579545MHZ
OR	645 000 4643	OSC,CRYSTAL 3.579545MHZ
OR	645 014 8361	OSC,CRYSTAL 3.579545MHZ
OR	645 000 5305	OSC,CRYSTAL 3.579545MHZ
X3001	645 008 8360	OSC,CERAMIC 8.500MHZ
X3002	613 109 0972	OSC,CRYSTAL 32KHZ
	(VARIABLE RESISTORS)	
VR351	645 006 5538	VR,SEMI,220K N
OR	645 003 5166	VR,SEMI,220K N
OR	645 003 5593	VR,SEMI,220K N
	(INDUCTORS)	
L1034	645 011 4946	INDUCTOR,4.7U J
OR	645 009 6181	INDUCTOR,4.7U J
L1048	645 003 6934	INDUCTOR,100U J
OR	645 003 7634	INDUCTOR,100U J
L1301	645 001 5533	INDUCTOR 82U J
OR	645 003 7610	INDUCTOR,82U J
L1302	645 001 5502	INDUCTOR 47U J
OR	645 003 8150	INDUCTOR,47U J
L1451	645 003 6934	INDUCTOR,100U J
OR	645 003 7634	INDUCTOR,100U J
L1506	645 002 1442	INDUCTOR 18U J
OR	645 003 7986	INDUCTOR,18U J
L2001	645 003 6934	INDUCTOR,100U J
OR	645 003 7634	INDUCTOR,100U J
L3001	645 006 3602	INDUCTOR,1.1UH
L3003	645 005 3870	INDUCTOR,1.8U M
OR	645 002 1640	INDUCTOR,1.8U K
L3004	645 006 3602	INDUCTOR,1.1UH
L3005	645 008 7400	CORE,BEAD
L3006	645 008 7400	CORE,BEAD
L5001 ⚠	645 023 0561	LINE FILTER
OR ⚠	645 010 0598	LINE FILTER
OR ⚠	645 000 3264	LINE FILTER
L5010	645 006 3602	INDUCTOR,1.1UH
L5101	645 011 6957	INDUCTOR,10U
L5102	645 006 3602	INDUCTOR,1.1UH
L6002	645 001 4550	INDUCTOR 10U K
OR	645 003 7900	INDUCTOR,10U K
L6013	645 003 7795	INDUCTOR,56U J
OR	645 003 7214	INDUCTOR,56U J
	(TRANSFORMERS)	
T2001	645 018 3515	TRANS,OSC,70KHZ
T5001 ⚠	645 013 8096	TRANS,POWER,PULSE,VWM-260 ONLY
OR ⚠	645 009 0011	TRANS,POWER,PULSE,VHR-M13 ONLY
	(CAPACITORS)	
C1010	403 191 8709	ELECT 1U M 50V
C1012	403 130 3109	CERAMIC 0.047U K 50V
C1014	403 072 1607	CERAMIC 0.022U K 50V
C1021	403 024 7206	CERAMIC 390P J 50V
C1022	403 069 5601	CERAMIC 0.01U K 50V
C1023	403 033 4609	CERAMIC 82P J 50V
C1024	403 014 9302	CERAMIC 180P J 50V
C1025	403 020 0508	CERAMIC 27P J 50V
C1026	403 139 2707	ELECT 1U M 50V

LOCATION	PARTS NO.	DESCRIPTION
C1027	403 139 2707	ELECT 1U M 50V
C1028	403 167 7002	ELECT 4.7U M 50V
C1029	403 191 8709	ELECT 1U M 50V
C1030	403 189 2405	ELECT 10U M 16V
C1031	403 028 4102	CERAMIC 56P J 50V
C1033	403 163 7907	ELECT 47U M 6.3V
C1034	403 068 0409	CERAMIC 0.1U Z 25V
C1036	403 191 8709	ELECT 1U M 50V
C1038	403 191 8709	ELECT 1U M 50V
C1040	403 193 7502	ELECT 22U M 6.3V
C1042	403 068 0409	CERAMIC 0.1U Z 25V
C1043	403 068 0409	CERAMIC 0.1U Z 25V
C1045	403 191 8709	ELECT 1U M 50V
C1046	403 191 8709	ELECT 1U M 50V
C1047	403 072 1607	CERAMIC 0.022U K 50V
C1048	403 163 7907	ELECT 47U M 6.3V
C1049	403 121 9509	CERAMIC 0.1U Z 50V
C1050	403 008 7505	CERAMIC 10P D 50V
C1051	403 191 8709	ELECT 1U M 50V
C1052	403 069 5601	CERAMIC 0.01U K 50V
C1053	403 130 3109	CERAMIC 0.047U K 50V
C1071	403 069 5601	CERAMIC 0.01U K 50V
C1105	403 009 5807	CERAMIC 100P J 50V
C1106	403 068 0409	CERAMIC 0.1U Z 25V
C1107	403 069 5601	CERAMIC 0.01U K 50V
C1108	403 068 0409	CERAMIC 0.1U Z 25V
C1109	403 189 2405	ELECT 10U M 16V
C1201	403 121 2401	ELECT 22U M 16V
C1301	403 020 0508	CERAMIC 27P J 50V
C1302	403 026 2902	CERAMIC 47P J 50V
C1304	403 069 5601	CERAMIC 0.01U K 50V
C1305	403 069 5601	CERAMIC 0.01U K 50V
C1306	403 068 0409	CERAMIC 0.1U Z 25V
C1401	403 107 9905	ELECT 10U M 16V
C1403	403 189 2405	ELECT 10U M 16V
C1451	403 135 4101	ELECT 470U M 6.3V
C1506	403 017 0900	CERAMIC 20P J 50V
C1507	403 017 0900	CERAMIC 20P J 50V
C1511	403 163 7907	ELECT 47U M 6.3V
C1512	403 068 0409	CERAMIC 0.1U Z 25V
C1516	403 068 0409	CERAMIC 0.1U Z 25V
C1523	403 109 6308	ELECT 1U M 50V
C1524	403 068 0409	CERAMIC 0.1U Z 25V
C1525	403 134 8100	ELECT 100U M 6.3V
C2001	403 139 2707	ELECT 1U M 50V
C2002	403 069 1702	CERAMIC 1000P K 50V
C2003	403 069 5601	CERAMIC 0.01U K 50V
C2004	403 139 1502	ELECT 10U M 16V
C2005	403 167 7002	ELECT 4.7U M 50V
C2006	403 068 0409	CERAMIC 0.1U Z 25V
C2007	403 167 7002	ELECT 4.7U M 50V
C2008	403 068 0409	CERAMIC 0.1U Z 25V
C2009	403 163 7907	ELECT 47U M 6.3V
C2010	403 139 0901	ELECT 33U M 6.3V
C2011	403 193 7502	ELECT 22U M 6.3V
C2012	403 068 0409	CERAMIC 0.1U Z 25V
C2013	403 075 5305	CERAMIC 8200P K 50V
C2014	403 139 1502	ELECT 10U M 16V
C2016	403 068 0409	CERAMIC 0.1U Z 25V
C2021	403 071 2902	CERAMIC 1800P K 50V
C2022	403 069 1702	CERAMIC 1000P K 50V
C2023	403 075 0706	CERAMIC 6800P K 50V
C2024	403 075 0706	CERAMIC 6800P K 50V
C2025	403 193 7809	ELECT 100U M 16V
C2026	403 081 3302	POLYPRO 0.022U J 100V
C2031	403 163 8409	ELECT 47U M 16V
C2032	403 159 8109	ELECT 100U M 6.3V
C2381	403 069 5601	CERAMIC 0.01U K 50V
C2383	403 069 5601	CERAMIC 0.01U K 50V
C3001	403 014 3409	CERAMIC 18P J 50V
C3002	403 018 0503	CERAMIC 22P J 50V
C3004	403 069 5601	CERAMIC 0.01U K 50V
C3005	403 069 5601	CERAMIC 0.01U K 50V
C3007	403 121 9509	CERAMIC 0.1U Z 50V
C3008	403 139 1502	ELECT 10U M 16V
C3009	403 069 5601	CERAMIC 0.01U K 50V
C3012	403 069 5601	CERAMIC 0.01U K 50V
C3016	403 069 5601	CERAMIC 0.01U K 50V
C3017	403 206 9004	ELECT 1000U M 6.3V,VWM-260 ONLY

LOCATION	PARTS NO.	DESCRIPTION
C3017	403 135 4002	ELECT 47U M 6.3V,VHR-M13 ONLY
C3022	403 305 4801	DL-ELECT 0.1F Z 5.5V,VHR-M13 ONLY
C3024	403 069 1702	CERAMIC 1000P K 50V
C3025	403 068 0409	CERAMIC 0.1U Z 25V
C3027	403 069 5601	CERAMIC 0.01U K 50V
C3031	403 068 0409	CERAMIC 0.1U Z 25V
C3035	403 069 5601	CERAMIC 0.01U K 50V
C3040	403 121 3408	ELECT 2.2U M 50V
C3041	403 068 0409	CERAMIC 0.1U Z 25V
C3050	403 163 7907	ELECT 47U M 6.3V
C3501	403 070 9803	CERAMIC 0.015U K 50V
C3502	403 075 0706	CERAMIC 6800P K 50V
C3503	403 069 5601	CERAMIC 0.01U K 50V
C3504	403 265 4903	ELECT 22U M 16V
C3505	403 265 4903	ELECT 22U M 16V
C3506	403 075 0706	CERAMIC 6800P K 50V
C3507	403 265 4903	ELECT 22U M 16V
C3508	403 265 4903	ELECT 22U M 16V
C3509	403 163 7907	ELECT 47U M 6.3V
C3510	403 001 1906	CERAMIC 0.01U M 16V
C3511	403 018 7502	CERAMIC 220P J 50V
C3512	403 061 4107	POLYESTER 0.039U K 50V
C3513	403 119 6701	CERAMIC 0.068U K 16V
C3514	403 260 2102	MT-COMPO 0.12U J 50V
C3515	403 063 0107	POLYESTER 6800P K 50V
C3516	403 071 8102	CERAMIC 2200P K 50V
C3517	403 001 3801	CERAMIC 1500P K 16V
C3518	403 068 0409	CERAMIC 0.1U Z 25V
C3519	403 121 9509	CERAMIC 0.1U Z 50V
C3522	403 069 1702	CERAMIC 1000P K 50V
C3523	403 191 8709	ELECT 1U M 50V
C3524	403 069 5601	CERAMIC 0.01U K 50V
C3525	403 193 8400	ELECT 0.22U M 50V
C3526	403 072 1607	CERAMIC 0.022U K 50V
C3529	403 167 6500	ELECT 33U M 6.3V
C3530	403 163 7907	ELECT 47U M 6.3V
C3531	403 150 6500	ELECT 22U M 16V
C3536	403 193 7601	ELECT 220U M 6.3V
C3540	403 009 5807	CERAMIC 100P J 50V
C3551	403 260 2904	MT-COMPO 0.33U J 50V
C3552	403 026 2902	CERAMIC 47P J 50V
C3553	403 191 8709	ELECT 1U M 50V
C3554	403 013 3103	CERAMIC 150P J 50V
C3555	403 069 5601	CERAMIC 0.01U K 50V
C3556	403 069 1702	CERAMIC 1000P K 50V
C3561	403 237 7901	MT-COMPO 0.22U J 50V
C5001 ⚠	404 032 5208	MT-COMPO 0.033U M 250V
C5002 ⚠	404 032 5208	MT-COMPO 0.033U M 250V
C5005 ⚠	404 074 0506	CERAMIC 470P K 250V
C5007 ⚠	404 074 0902	CERAMIC 4700P M 250V
C5010	403 264 1606	ELECT 47U M 200V,VWM-260 ONLY
OR	403 317 4707	ELECT 100U M 400V,VHR-M13 ONLY
C5011	403 304 8909	ELECT 2.2U M 50V
C5015	403 057 3107	POLYESTER 0.1U K 50V
C5017	403 024 7107	CERAMIC 390P J 50V,VHR-M13 ONLY
OR	403 014 9203	CERAMIC 180P J 50V,VWM-260 ONLY
C5020	403 255 8409	CERAMIC 39P J 1K,VHR-M13 ONLY
OR	403 247 6505	CERAMIC 680P K 1KV,VWM-260 ONLY
C5021	403 076 0507	CERAMIC 2200P K 500V
C5022	403 222 1303	CERAMIC 1000P K 1KV,VHR-M13 ONLY
C5024	403 076 0507	CERAMIC 2200P K 500V,VHR-M13 ONLY
C5101	403 313 9508	ELECT 1000U M 10V,VHR-M13 ONLY
OR	403 314 0900	ELECT 470U M 25V,VWM-260 ONLY
C5102	403 135 3302	ELECT 1000U M 6.3V
C5105	403 314 0900	ELECT 470U M 25V
C5106	403 218 3106	ELECT 1000U M 16V
C5108	403 301 1200	ELECT 22U M 50V
C5109	403 301 1309	ELECT 47U M 35V
C5110	403 301 1507	ELECT 220U M 6.3V
C5113	403 126 4509	ELECT 100U M 16V
C5115	403 135 4002	ELECT 47U M 6.3V
C5116	403 135 7805	ELECT 3.3U M 50V
C5120	403 075 6906	CERAMIC 100P K 500V
C5121	403 076 3607	CERAMIC 470P K 500V
C5124	403 108 0000	ELECT 0.22U M 50V,VWM-260 ONLY
OR	403 135 5801	ELECT 0.1U M 50V,VHR-M13 ONLY
C5135	403 121 3408	ELECT 2.2U M 50V,VWM-260 ONLY
OR	403 130 2904	ELECT 0.47U M 50V,VHR-M13 ONLY
C6004	403 024 7107	CERAMIC 390P J 50V
C6005	403 135 4002	ELECT 47U M 6.3V
C6006	403 069 5601	CERAMIC 0.01U K 50V
C6007	403 135 7409	ELECT 22U M 50V
C6009	403 068 0409	CERAMIC 0.1U Z 25V
C6011	403 135 4002	ELECT 47U M 6.3V
C6012	403 134 9602	ELECT 47U M 16V
C6013	403 069 5601	CERAMIC 0.01U K 50V
C6016	403 069 1702	CERAMIC 1000P K 50V
C6029	403 009 5708	CERAMIC 100P J 50V
C6030	403 009 5708	CERAMIC 100P J 50V
C6031	403 189 2405	ELECT 10U M 16V
C6032	403 070 6703	CERAMIC 0.012U K 50V
C6033	403 070 6703	CERAMIC 0.012U K 50V
	(RESISTORS)	
R1020	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1023	401 037 8005	MT-GLAZE 15K JA 1/10W
R1025	401 107 2001	MT-FILM 4.7K FD 1/4W
R1026	401 038 9001	MT-GLAZE 680 JA 1/10W
R1027	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1029	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R1031	401 038 2200	MT-GLAZE 27K JA 1/10W
R1035	401 037 5202	MT-GLAZE 100 JA 1/10W
R1043	401 038 3702	MT-GLAZE 33K JA 1/10W
R1044	401 037 5400	MT-GLAZE 1K JA 1/10W
R1045	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R1047	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1049	401 037 5400	MT-GLAZE 1K JA 1/10W
R1050	401 038 9001	MT-GLAZE 680 JA 1/10W
R1051	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R1071	401 037 5608	MT-GLAZE 10K JA 1/10W
R1103	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1106	401 039 0601	MT-GLAZE 820K JA 1/10W
R1107	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1108	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1201	401 022 3008	CARBON 6.8K JA 1/4W
R1301	401 038 6307	MT-GLAZE 470 JA 1/10W
R1302	401 038 6307	MT-GLAZE 470 JA 1/10W
R1303	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R1304	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1305	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1306	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1308	401 038 0107	MT-GLAZE 2K JA 1/10W
R1401	401 038 9506	MT-GLAZE 75 JA 1/10W
R1402	401 038 5003	MT-GLAZE 390 JA 1/10W
R1403	401 038 5003	MT-GLAZE 390 JA 1/10W
R1451	401 038 9506	MT-GLAZE 75 JA 1/10W
R1452	401 018 1506	CARBON 33 JA 1/4W
R1453	401 018 1506	CARBON 33 JA 1/4W
R1510	401 037 5400	MT-GLAZE 1K JA 1/10W
R1511	401 037 5400	MT-GLAZE 1K JA 1/10W
R2001	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2002	401 037 5608	MT-GLAZE 10K JA 1/10W
R2003	401 037 6803	MT-GLAZE 12K JA 1/10W
R2004	401 038 3801	MT-GLAZE 330K JA 1/10W
R2005	401 038 0602	MT-GLAZE 220 JA 1/10W
R2006	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2009	401 038 1005	MT-GLAZE 2.2M JA 1/10W
R2010	401 038 6505	MT-GLAZE 47K JA 1/10W
R2011	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2012	401 038 6505	MT-GLAZE 47K JA 1/10W
R2013	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2014	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2021	401 038 2200	MT-GLAZE 27K JA 1/10W
R2022	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R2023	401 037 5400	MT-GLAZE 1K JA 1/10W
R2024	401 038 6208	MT-GLAZE 47 JA 1/10W
R2025	401 011 8809	CARBON 1 JA 1/4W
R2026	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2027	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2028	401 037 9101	MT-GLAZE 180 JA 1/10W
R2029	401 037 5608	MT-GLAZE 10K JA 1/10W
R2030	401 038 0800	MT-GLAZE 22K JA 1/10W
R2380	401 037 5400	MT-GLAZE 1K JA 1/10W
R2385	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2387	401 038 9001	MT-GLAZE 680 JA 1/10W
R3001 ⚠	402 067 7402	FUSIBLE RES 3.3 JA 1/2W
R3002	401 038 0800	MT-GLAZE 22K JA 1/10W
R3003	401 038 0800	MT-GLAZE 22K JA 1/10W
R3004	401 037 9200	MT-GLAZE 1.8K JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R3005	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R3006	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R3007	401 038 2200	MT-GLAZE 27K JA 1/10W
R3008	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3009	401 023 1607	CARBON 820 JA 1/4W
R3011	401 038 6505	MT-GLAZE 47K JA 1/10W
R3013	401 020 1907	CARBON 4.7K JA 1/4W
R3014	401 037 8708	MT-GLAZE 16K JA 1/10W
R3015	401 037 8708	MT-GLAZE 16K JA 1/10W
R3016	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R3017	401 012 5609	CARBON 1K JA 1/4W
R3018	401 012 6903	CARBON 10K JA 1/4W
R3019	401 038 2200	MT-GLAZE 27K JA 1/10W
R3022	401 037 5608	MT-GLAZE 10K JA 1/10W
R3023	401 037 5400	MT-GLAZE 1K JA 1/10W
R3024	401 037 5400	MT-GLAZE 1K JA 1/10W
R3025	401 037 5400	MT-GLAZE 1K JA 1/10W
R3026	401 037 5400	MT-GLAZE 1K JA 1/10W
R3029	401 037 5400	MT-GLAZE 1K JA 1/10W
R3031	401 012 5609	CARBON 1K JA 1/4W
R3032	401 037 5400	MT-GLAZE 1K JA 1/10W
R3039	401 012 5609	CARBON 1K JA 1/4W
R3040	401 012 6903	CARBON 10K JA 1/4W
R3063	401 038 6505	MT-GLAZE 47K JA 1/10W
R3101	401 037 5608	MT-GLAZE 10K JA 1/10W
R3102	401 037 5608	MT-GLAZE 10K JA 1/10W
R3103	401 037 5608	MT-GLAZE 10K JA 1/10W
R3104	401 037 5608	MT-GLAZE 10K JA 1/10W
R3501	401 037 5707	MT-GLAZE 100K JA 1/10W
R3502	401 037 5707	MT-GLAZE 100K JA 1/10W
R3503	401 038 6604	MT-GLAZE 470K JA 1/10W
R3504	401 037 5707	MT-GLAZE 100K JA 1/10W
R3505	401 037 5608	MT-GLAZE 10K JA 1/10W
R3506	401 038 0909	MT-GLAZE 220K JA 1/10W
R3507	401 014 6000	CARBON 150K JA 1/4W
R3508	401 038 6505	MT-GLAZE 47K JA 1/10W
R3510	401 038 2200	MT-GLAZE 27K JA 1/10W
R3517	401 038 6505	MT-GLAZE 47K JA 1/10W
R3518	401 020 2805	CARBON 47K JA 1/4W
R3520	401 038 5409	MT-GLAZE 390K JA 1/10W
R3521	401 037 5608	MT-GLAZE 10K JA 1/10W
R3525	401 012 5609	CARBON 1K JA 1/4W
R3526	401 016 3700	CARBON 2.2K JA 1/4W
R3527	401 012 5609	CARBON 1K JA 1/4W
R3528	401 038 7106	MT-GLAZE 510 JA 1/10W
R3529	401 038 7106	MT-GLAZE 510 JA 1/10W
R3531	401 038 9001	MT-GLAZE 680 JA 1/10W
R3532	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3537	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R3539	401 037 5202	MT-GLAZE 100 JA 1/10W
R3546	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3549	401 037 5608	MT-GLAZE 10K JA 1/10W
R3550	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R3556	401 037 5608	MT-GLAZE 10K JA 1/10W
R3557	401 038 3801	MT-GLAZE 330K JA 1/10W
R3558	401 038 6307	MT-GLAZE 470 JA 1/10W
R3560	401 037 5400	MT-GLAZE 1K JA 1/10W
R3561	401 038 9308	MT-GLAZE 68K JA 1/10W
R5001	402 013 9108	SOLID 2.7M KB 1/2W
R5002	401 015 4609	CARBON 180K JA 1/4W
R5003	401 015 4609	CARBON 180K JA 1/4W
R5004	401 037 9408	MT-GLAZE 180K JA 1/10W,VHR-M13 ONLY
OR	401 038 3801	MT-GLAZE 330K JA 1/10W,VWM-260 ONLY
R5006	401 037 5608	MT-GLAZE 10K JA 1/10W,VHR-M13 ONLY
R5007	401 016 4707	CARBON 22K JA 1/4W,VWM-260 ONLY
OR	401 012 6903	CARBON 10K JA 1/4W,VHR-M13 ONLY
R5009	401 012 8006	CARBON 100K JA 1/4W,VWM-260 ONLY
OR	401 022 4005	CARBON 68K JA 1/4W,VHR-M13 ONLY
R5012	401 037 5400	MT-GLAZE 1K JA 1/10W,VHR-M13 ONLY
OR	401 038 2101	MT-GLAZE 2.7K JA 1/10W,VWM-260 ONLY
R5014	401 037 5103	MT-GLAZE 10 JA 1/10W,VWM-260 ONLY
OR	401 038 2002	MT-GLAZE 270 JA 1/10W,VHR-M13 ONLY
R5015	401 037 8104	MT-GLAZE 150K JA 1/10W,VWM-260 ONLY
R5020	401 058 2303	OXIDE-MT 100 JA 1W,VWM-260 ONLY
OR	401 150 6902	OXIDE-MT 390K JA 1W,VHR-M13 ONLY
R5021	401 058 2303	OXIDE-MT 100 JA 1W,VWM-260 ONLY
OR	401 150 6902	OXIDE-MT 390K JA 1W,VHR-M13 ONLY
R5026	401 037 5608	MT-GLAZE 10K JA 1/10W,VWM-260 ONLY
R5101	401 018 2701	CARBON 330 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R5102	401 019 0904	CARBON 390 JA 1/4W,VHR-M13 ONLY
OR	401 021 1807	CARBON 560 JA 1/4W,VWM-260 ONLY
R5103	401 021 1807	CARBON 560 JA 1/4W
R5104	401 015 2605	CARBON 1.8K JA 1/4W
R5111	401 019 0904	CARBON 390 JA 1/4W,VWM-260 ONLY
OR	401 021 1807	CARBON 560 JA 1/4W,VHR-M13 ONLY
R5112	401 019 1802	CARBON 3.9K JA 1/4W,VHR-M13 ONLY
OR	401 020 1907	CARBON 4.7K JA 1/4W,VWM-260 ONLY
R5114	401 016 9603	CARBON 27 JA 1/4W,VHR-M13 ONLY
OR	401 021 1807	CARBON 560 JA 1/4W,VWM-260 ONLY
R5115	401 019 0904	CARBON 390 JA 1/4W
R5118	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R5119	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R5120 ⚠	402 004 2705	FUSIBLE RES 8.2 JA 1/4W
R5121	401 021 7007	CARBON 6.8 JA 1/4W
R5122	401 023 2703	CARBON 8.2K JA 1/4W
R5123	401 015 2605	CARBON 1.8K JA 1/4W
R5125 ⚠	402 071 3100	FUSIBLE RES 27 JA 1/4W,VHR-M13 ONLY
R5135	401 022 0700	CARBON 68 JA 1/4W,VHR-M13 ONLY
OR	401 022 1806	CARBON 680 JA 1/4W,VWM-260 ONLY
R6001	401 037 5400	MT-GLAZE 1K JA 1/10W
R6002	401 037 5202	MT-GLAZE 100 JA 1/10W
R6004	401 012 5609	CARBON 1K JA 1/4W
R6007 ⚠	402 067 8706	FUSIBLE RES 680 JA 1/6W
R6008	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R6009	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R6016	401 038 5409	MT-GLAZE 390K JA 1/10W
R6017	401 038 7908	MT-GLAZE 560K JA 1/10W
	(SWITCHES)	
S6001	645 017 7224	SWITCH,SLIDE 1P-2T,
OR	645 001 8350	SWITCH,SLIDE 1P-2T,
	(FUSES)	
F5001 ⚠	423 023 6406	FUSE 250V 2A,VWM-260 ONLY
OR ⚠	423 021 6804	FUSE 125V 2A,VWM-260 ONLY
OR ⚠	423 018 0907	FUSE 250V 2A,VHR-M13 ONLY
	(JACKS)	
JK101	645 006 9314	JACK,RCA (N.S.P),
OR	645 008 7608	JACK,RCA-2 (N.S.P),
OR	645 020 8928	JACK,RCA-2 (N.S.P),
JK201	645 008 7592	JACK,RCA-2 (N.S.P),
OR	645 020 8935	JACK,RCA-2 (N.S.P),
OR	645 006 9307	JACK,RCA (N.S.P),
	(CONNECTORS)	
CN303	645 007 8422	PLUG,12P (N.S.P)
CN321	645 009 4347	SOCKET,FFC 29P (N.S.P),VWM-260 ONLY
OR	645 005 4747	SOCKET,29P (N.S.P),VWM-260 ONLY
OR	645 009 4361	SOCKET,FFC 31P (N.S.P),VHR-M13 ONLY
OR	645 005 4761	SOCKET,31P (N.S.P),VHR-M13 ONLY
CN351	645 007 8927	PLUG,6P (N.S.P)
CN352	645 008 1842	PLUG,8P (N.S.P)
CN501 ⚠	645 000 7019	SOCKET,INLET AC (N.S.P)
	(MISCELLANEOUS)	
	613 053 8048	FIXER
	645 016 0479	HOLDER,FUSE
OR	645 008 7677	HOLDER,FUSE

COMPL PWB,VP-1(N.S.P)

613 174 6848

	(INTEGRATED CIRCUITS)	
IC181	409 391 5203	IC LA70002L
C1805	403 068 0409	CERAMIC 0.1U Z 25V
C1806	403 069 5601	CERAMIC 0.01U K 50V
C1807	403 163 7907	ELECT 47U M 6.3V
C1808	403 068 0409	CERAMIC 0.1U Z 25V
C1809	403 191 8709	ELECT 1U M 50V
C1810	403 069 5601	CERAMIC 0.01U K 50V
C1812	403 018 0602	CERAMIC 22P J 50V
C1813	403 018 0602	CERAMIC 22P J 50V
C1835	403 068 0409	CERAMIC 0.1U Z 25V
C1836	403 068 0409	CERAMIC 0.1U Z 25V
	(RESISTORS)	
R1801	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1802	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1804	401 038 9001	MT-GLAZE 680 JA 1/10W
R1806	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1807	401 037 5400	MT-GLAZE 1K JA 1/10W
R1831	401 039 0304	MT-GLAZE 820 JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R1832	401 038 3603	MT-GLAZE 3.3K JA 1/10W
	(CONNECTORS)	
CN182	645 011 3833	SOCKET,FFC 5P (N.S.P)
OR	645 009 4095	SOCKET,FFC 5P (N.S.P)

COMPL PWB,TM-1(N.S.P)

613 173 7228 VHR-M13 ONLY
613 173 2872 VWM-260 ONLY

	(DIODES)	
D7101	407 012 4406	DIODE 1SS133
D7102	407 012 4406	DIODE 1SS133
D7103	407 012 4406	DIODE 1SS133
D7104	407 012 4406	DIODE 1SS133
	(CAPACITORS)	
C7101	403 043 8802	ELECT 4.7U M 16V
	(SWITCHES)	
S7101	645 011 5165	SWITCH,PUSH 1P-1T, POWER
OR	645 001 9777	SWITCH,PUSH 1P-1T, POWER
OR	645 011 5172	SWITCH,PUSH 1P-1T, POWER
OR	645 006 2797	SWITCH,PUSH 1P-1T, POWER
OR	645 008 8049	SWITCH,PUSH 1P-1T, POWER
S7102	645 008 8049	SWITCH,PUSH 1P-1T, STOP/EJECT
OR	645 001 9777	SWITCH,PUSH 1P-1T, STOP/EJECT
OR	645 011 5172	SWITCH,PUSH 1P-1T, STOP/EJECT
OR	645 011 5165	SWITCH,PUSH 1P-1T, STOP/EJECT
OR	645 006 2797	SWITCH,PUSH 1P-1T, STOP/EJECT
S7103	645 008 8049	SWITCH,PUSH 1P-1T, CH-UP
OR	645 001 9777	SWITCH,PUSH 1P-1T, CH-UP
OR	645 011 5172	SWITCH,PUSH 1P-1T, CH-UP
OR	645 011 5165	SWITCH,PUSH 1P-1T, CH-UP
OR	645 006 2797	SWITCH,PUSH 1P-1T, CH-UP
S7104	645 008 8049	SWITCH,PUSH 1P-1T, CH-DOWN
OR	645 011 5165	SWITCH,PUSH 1P-1T, CH-DOWN
OR	645 006 2797	SWITCH,PUSH 1P-1T, CH-DOWN
OR	645 001 9777	SWITCH,PUSH 1P-1T, CH-DOWN
OR	645 011 5172	SWITCH,PUSH 1P-1T, CH-DOWN
S7106	645 006 2797	SWITCH,PUSH 1P-1T, PAUSE
OR	645 008 8049	SWITCH,PUSH 1P-1T, PAUSE
OR	645 011 5165	SWITCH,PUSH 1P-1T, PAUSE
OR	645 001 9777	SWITCH,PUSH 1P-1T, PAUSE
OR	645 011 5172	SWITCH,PUSH 1P-1T, PAUSE
S7107	645 008 8049	SWITCH,PUSH 1P-1T, REW
OR	645 001 9777	SWITCH,PUSH 1P-1T, REW
OR	645 006 2797	SWITCH,PUSH 1P-1T, REW
OR	645 011 5172	SWITCH,PUSH 1P-1T, REW
OR	645 011 5165	SWITCH,PUSH 1P-1T, REW
S7108	645 011 5165	SWITCH,PUSH 1P-1T, PLAY
OR	645 006 2797	SWITCH,PUSH 1P-1T, PLAY
OR	645 008 8049	SWITCH,PUSH 1P-1T, PLAY
OR	645 001 9777	SWITCH,PUSH 1P-1T, PLAY
OR	645 011 5172	SWITCH,PUSH 1P-1T, PLAY
S7109	645 006 2797	SWITCH,PUSH 1P-1T, FF
OR	645 008 8049	SWITCH,PUSH 1P-1T, FF
OR	645 001 9777	SWITCH,PUSH 1P-1T, FF
OR	645 011 5172	SWITCH,PUSH 1P-1T, FF
OR	645 011 5165	SWITCH,PUSH 1P-1T, FF
S7110	645 008 8049	SWITCH,PUSH 1P-1T, REC
OR	645 001 9777	SWITCH,PUSH 1P-1T, REC
OR	645 011 5172	SWITCH,PUSH 1P-1T, REC
OR	645 011 5165	SWITCH,PUSH 1P-1T, REC
OR	645 006 2797	SWITCH,PUSH 1P-1T, REC
	(REMOTE RECEIVERS)	
RR711	645 021 6152	UNIT,IR RECEIVER PACK
OR	645 006 8720	UNIT,IR RECEIVER PACK
	(DISPLAYS)	
A7101	645 007 1485	FLUORESCENT TUBE
	(CONNECTORS)	
CN711	645 005 4761	SOCKET,31P (N.S.P),VHR-M13 ONLY
OR	645 005 4747	SOCKET,29P (N.S.P),VWM-260 ONLY
OR	645 009 4361	SOCKET,FFC 31P (N.S.P),VHR-M13 ONLY
OR	645 009 4347	SOCKET,FFC 29P (N.S.P),VWM-260 ONLY
	(MISCELLANEOUS)	
	613 173 7488	HOLDER,IR
OR	613 163 1700	HOLDER IR, RR711
	613 139 2267	HOLDER FL, FL

LOCATION	PARTS NO.	DESCRIPTION

COMPL PWB,MC-1(N.S.P)

	613 173 9451	
	(CAPACITORS)	
C8001	403 121 9509	CERAMIC 0.1U Z 50V
	(RESISTORS)	
R8001	401 015 2605	CARBON 1.8K JA 1/4W
R8002	401 023 1607	CARBON 820 JA 1/4W
R8003	401 017 0708	CARBON 270 JA 1/4W
R8004	401 014 2804	CARBON 150 JA 1/4W
	(SWITCHES)	
S8002	645 003 4589	SWITCH,DETECTOR 1P-1T
OR	645 009 3388	SWITCH,DETECTOR 1P-1T
	(CONNECTORS)	
CN801	645 007 8446	SOCKET,12P (N.S.P)
	(MISCELLANEOUS)	
	613 152 4002	SPACER,MC1

FLEXIBLE FLAT CABLES

645 010 1977	FLEXIBLE FLAT CABLE(CN321-CN711) VWM-260 ONLY
645 008 9992	FLEXIBLE FLAT CABLE(CN321-CN711) VHR-M13 ONLY

Feb./'97/2200 NS Printed in Japan

For Parts or Service Contact
SANYO FISHER SERVICE CORPORATION.
1200 West Artesia Blvd., Compton, California, 90220.

VWM-260
VHR-M13

BLOCK DIAGRAMS, CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS

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MA2/U,MA 72N

REFERENCE No.SM531572

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN COMPONENT REPLACEMENT IS MADE IN ANY AREA OF A UNIT COMPONENTS INDICATED BY THE SYMBOL ⚠ IN THIS SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAVE SPECIAL SIGNIFICANCE TO PRODUCT SAFETY IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE ATTACHED PARTS LIST BE USED TO COMPONENTS REPLACE DESIGNATED BY THE SYMBOL ⚠ .

NOTE:

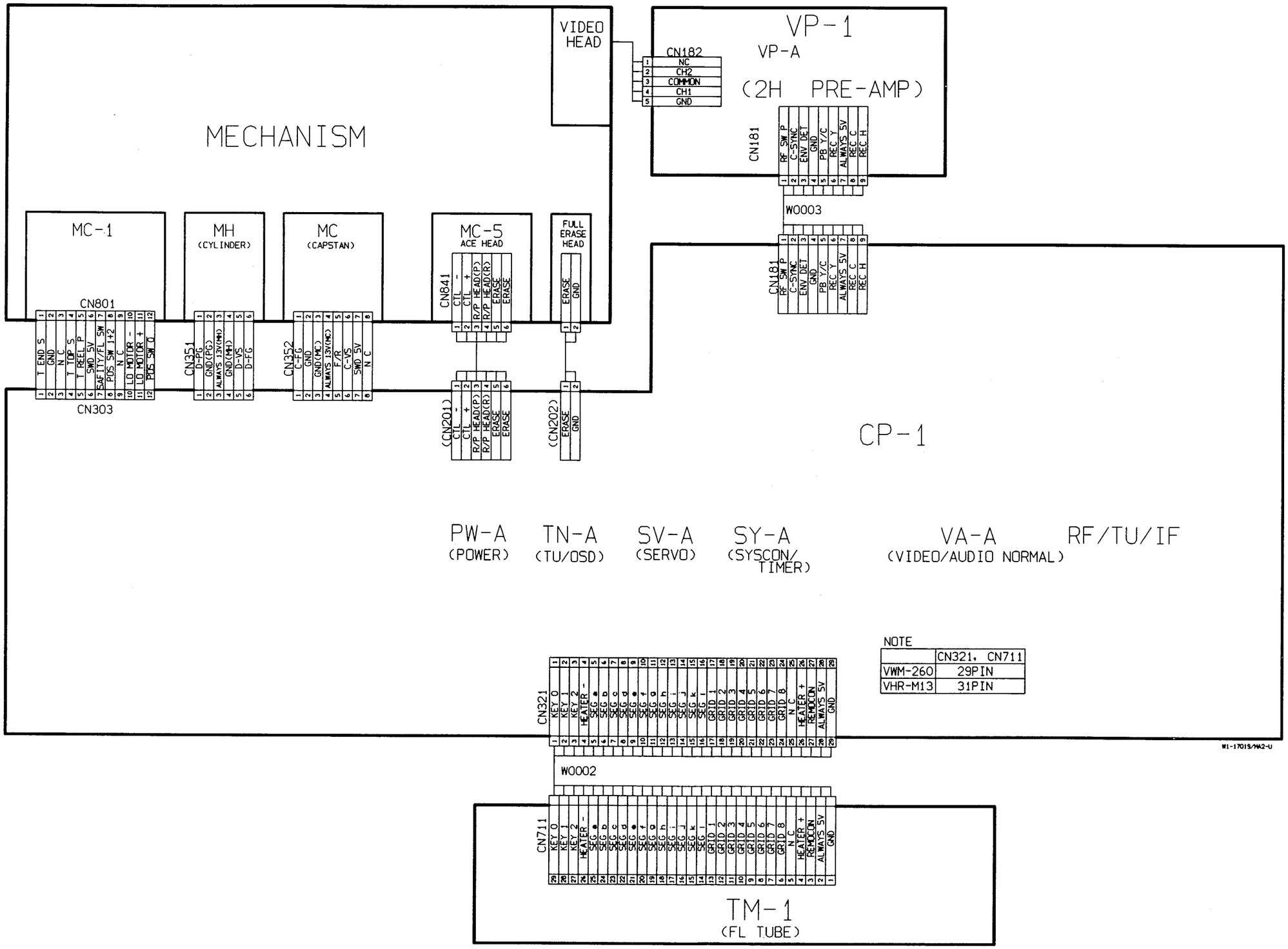
1. N.S.P. : Not available as service parts.
2. All resistance values in "OHMS" unless otherwise noted.
   (K=1,000 ; M=1,000,000)
3. All inductance values in "μH" unless otherwise noted.
   μ , u or U=micro henry ; m=milli henry
4. All capacitance values in "μF" unless otherwise noted.
   p=pico farad ; μ , u or U=micro farad
5. Voltage reading may vary ± 20%.
6. This is a fundamental circuit diagram, some production changes may be made without revision of the diagram.

EXPLANATORY NOTES (EXAMPLES)

Resistor	10K:16J means 10kilo ohm ±5%, 1/16watt max.
	1M:1/10K means 1mega ohm ±10%, 1/10watt max.
Capacitor	0.047:F means 0.047micro farad, Ftype.
Chemical capacitor	
	10:16 means 10micro farad, 16volt max.
Inductor	330:J means 330micro henry ±5%
	470:K means 470micro henry ±10%

1. OVERALL WIRING,MECHANISM CONNECTION & BLOCK DIAGRAMS

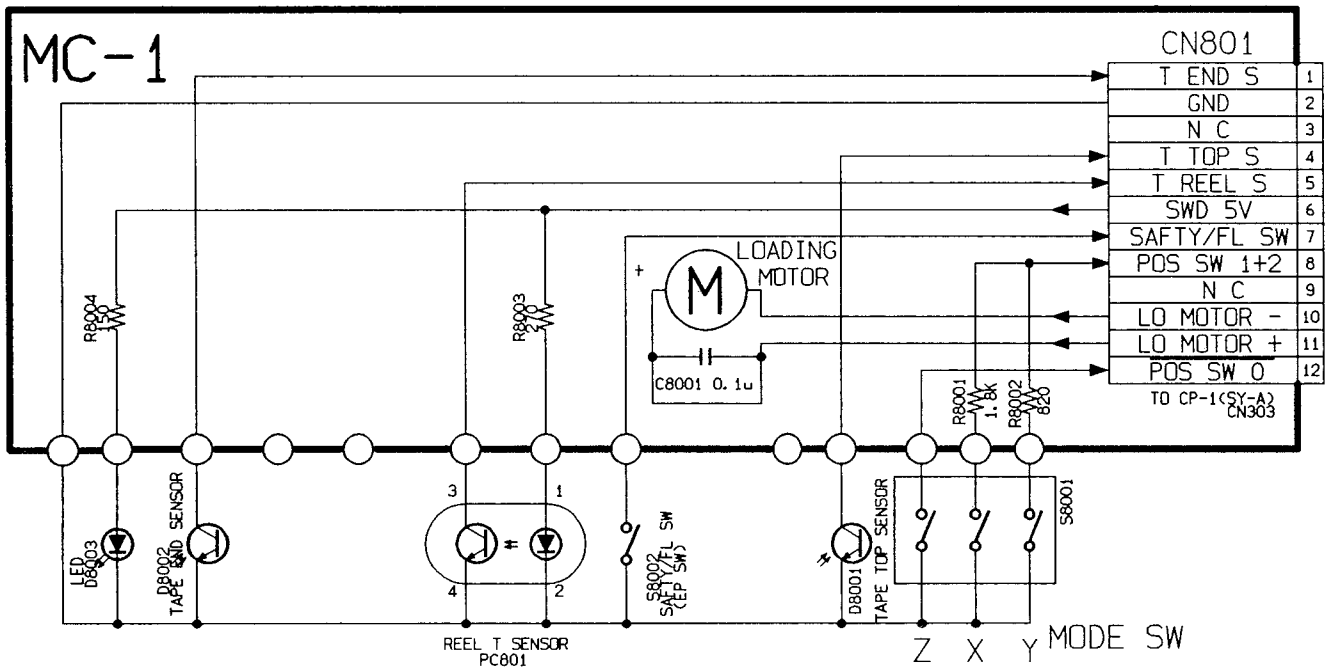
OVERALL WIRING

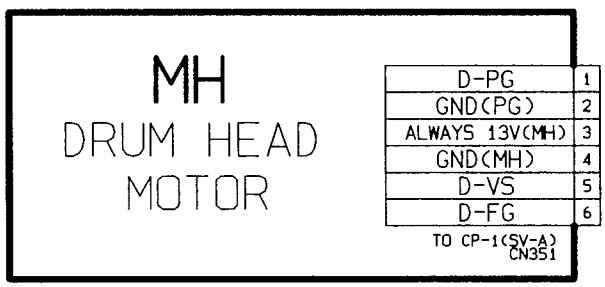


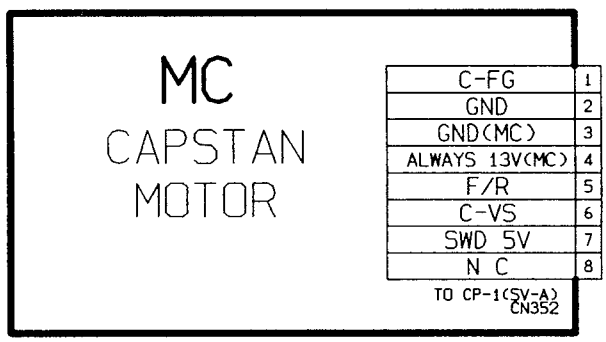
NOTE

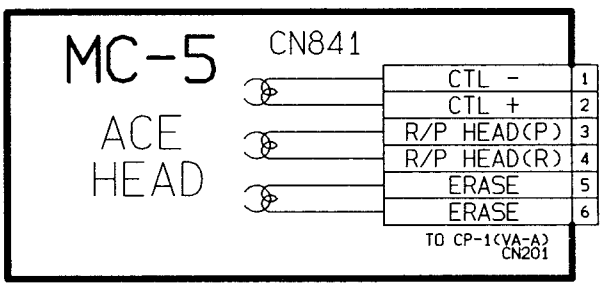
	CN321, CN711
VWM-260	29PIN
VHR-M13	31PIN

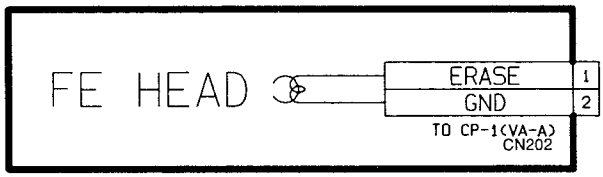
MECHANISM CONNECTION







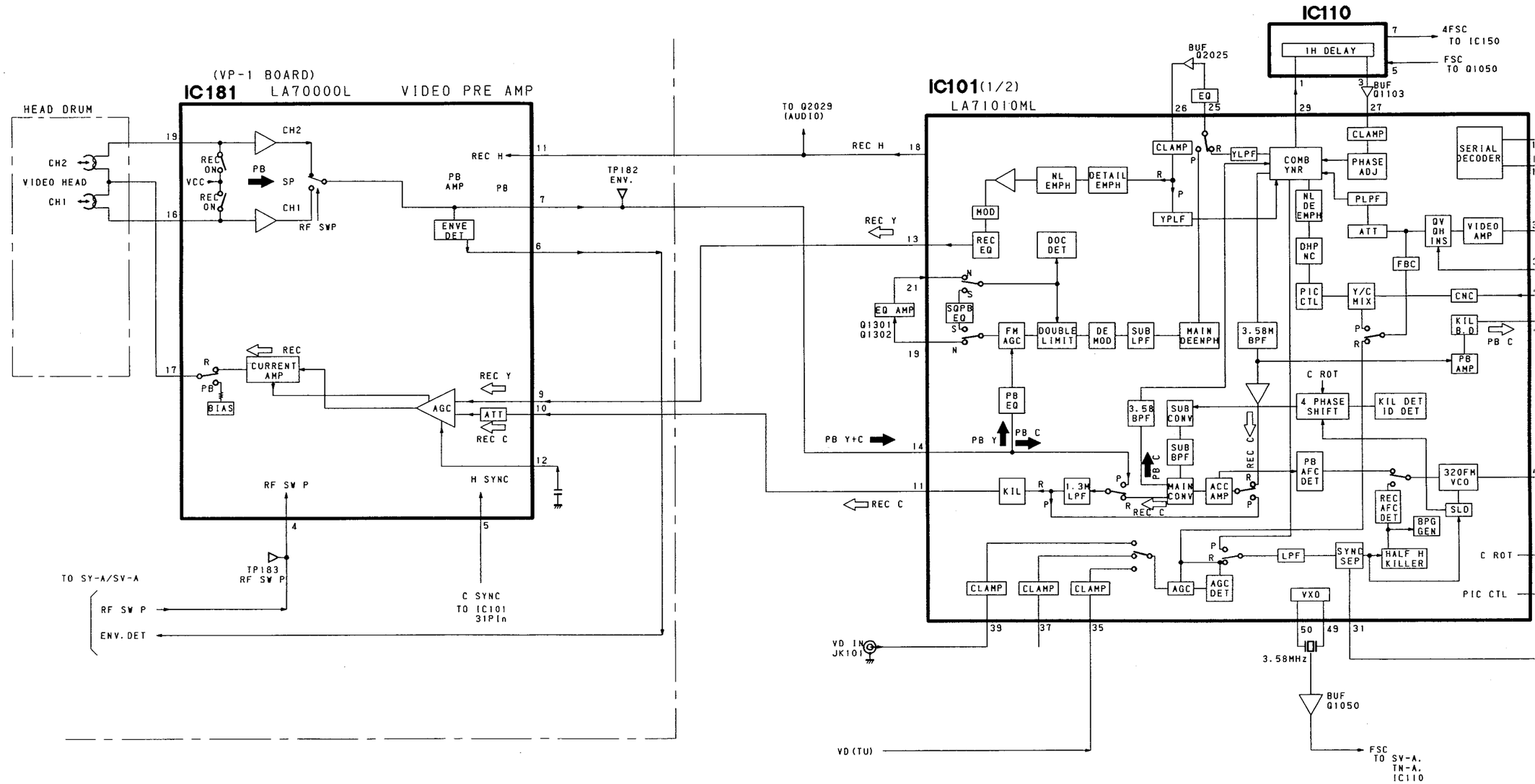




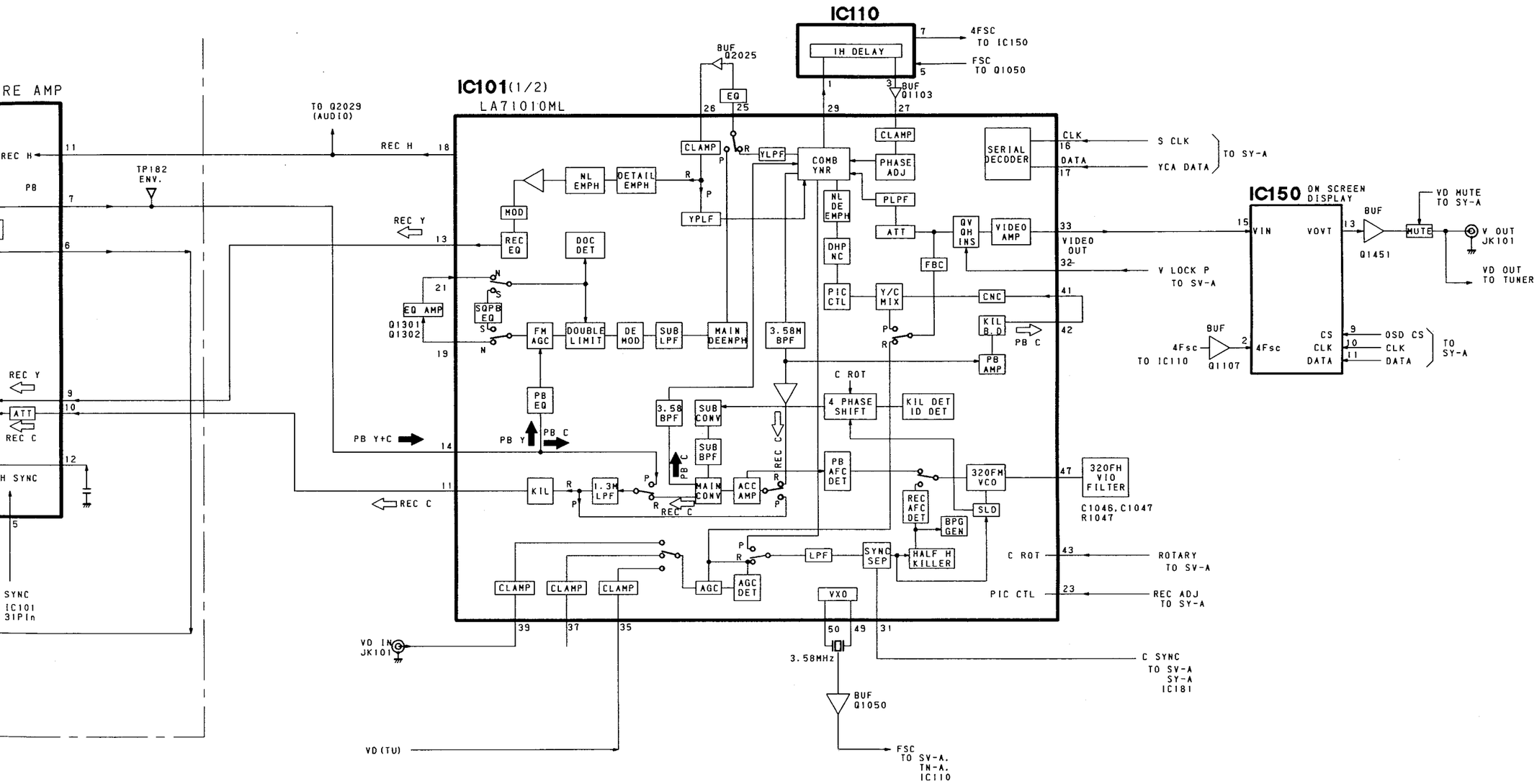
M1-17108/MP4-GSY

16 17 18 19 20 21 22 23

VIDEO CIRCUIT



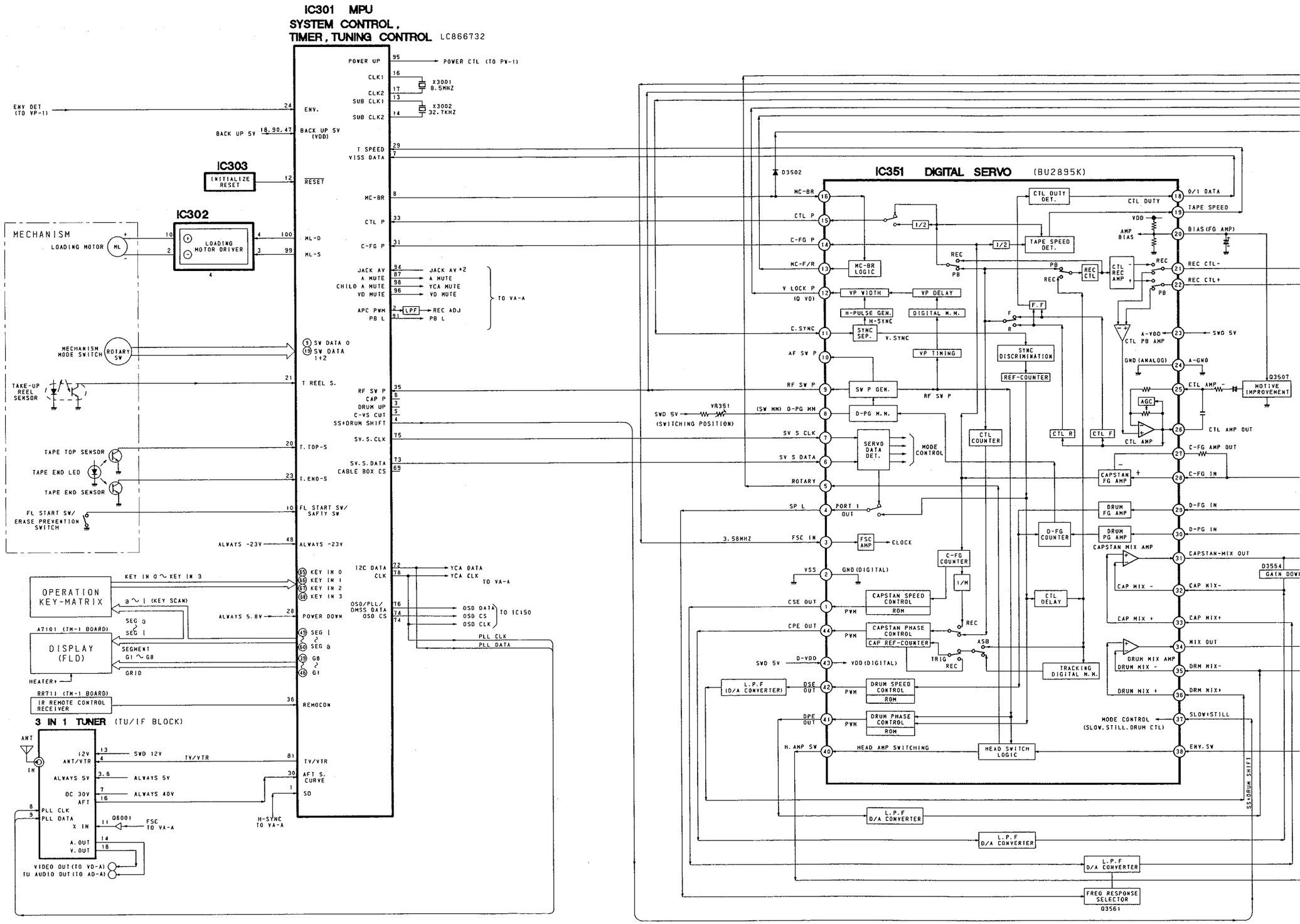
VIDEO CIRCUIT



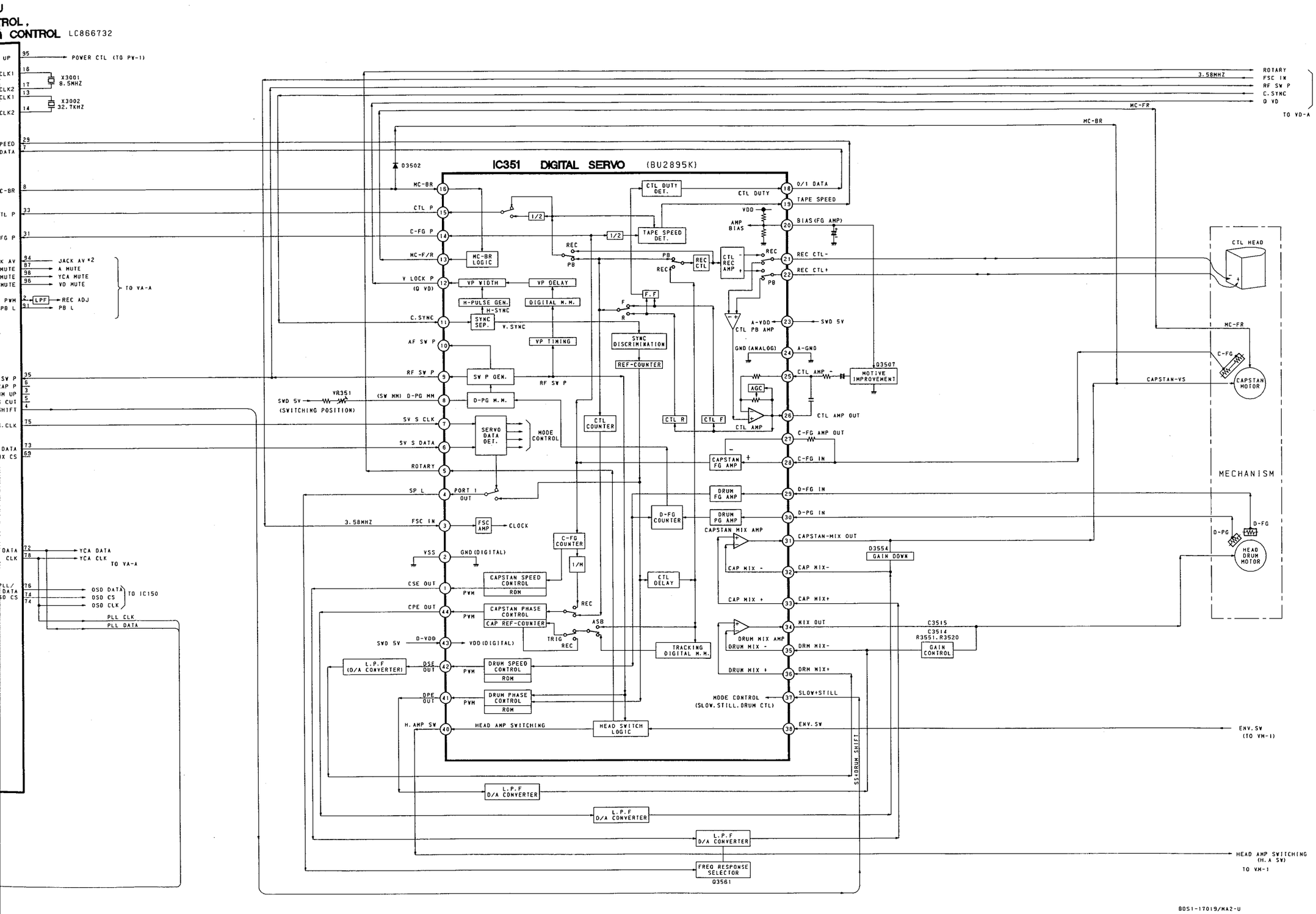
BDV1-17033/MA2-U

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

SYSTEM CONTROL & SERVO CIRCUIT

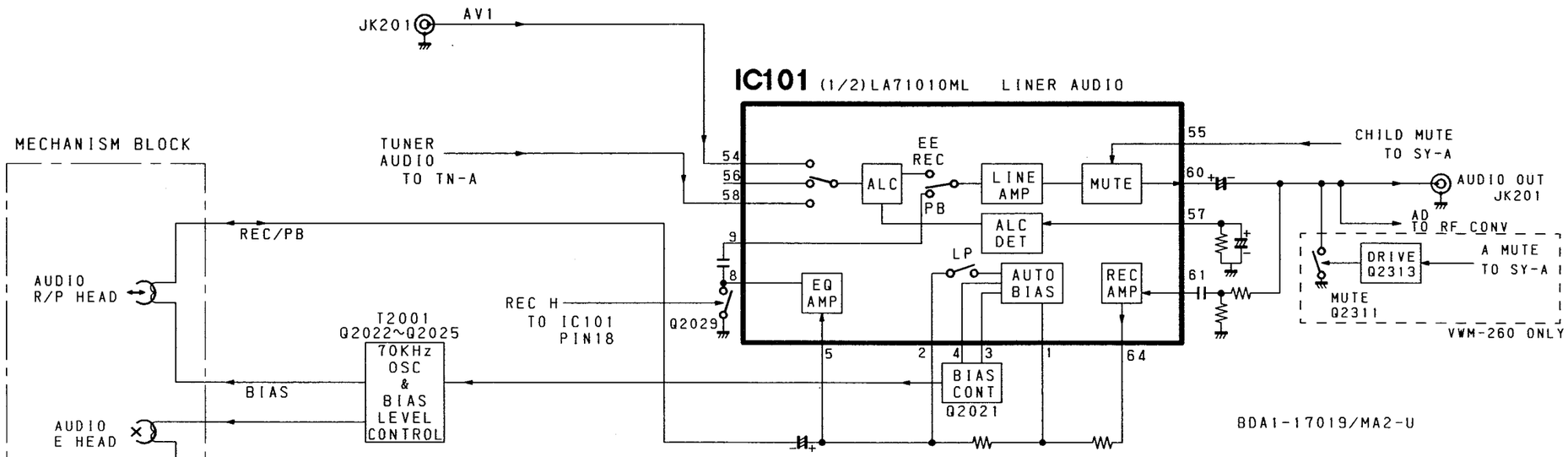


SYSTEM CONTROL & SERVO CIRCUIT



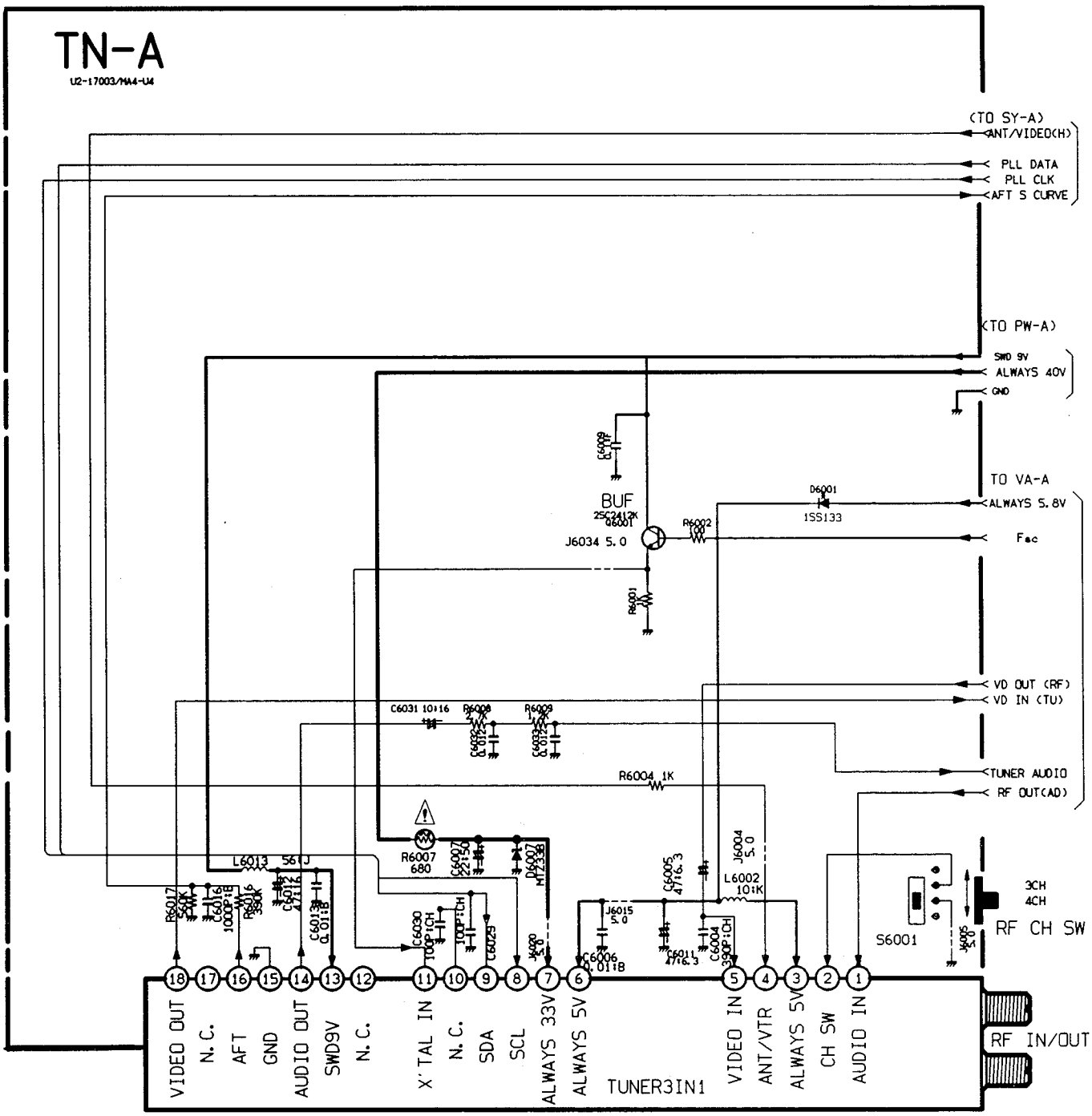
BDS1-17019/MA2-U

AUDIO CIRCUIT

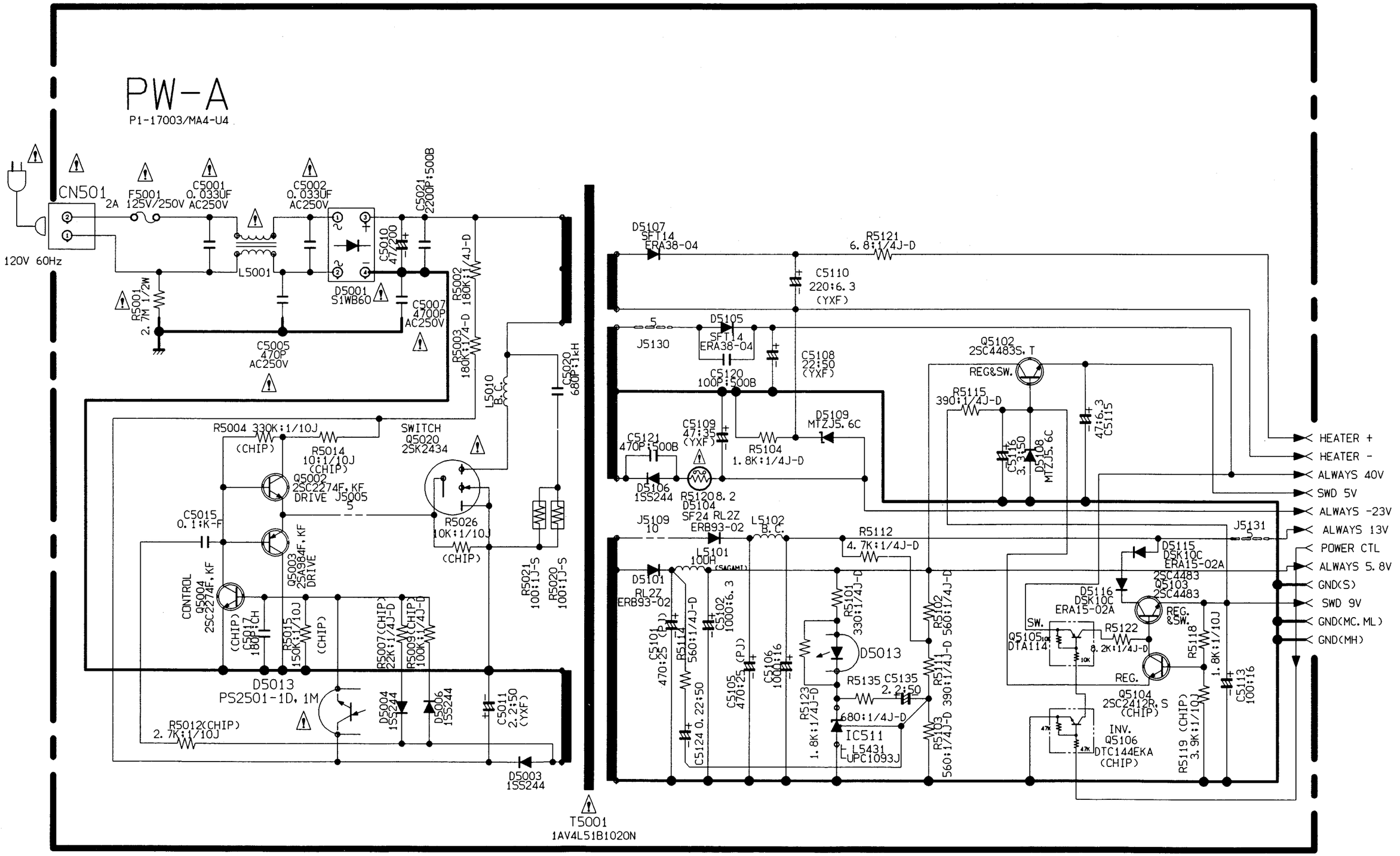


2. CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS (P.W.B.)

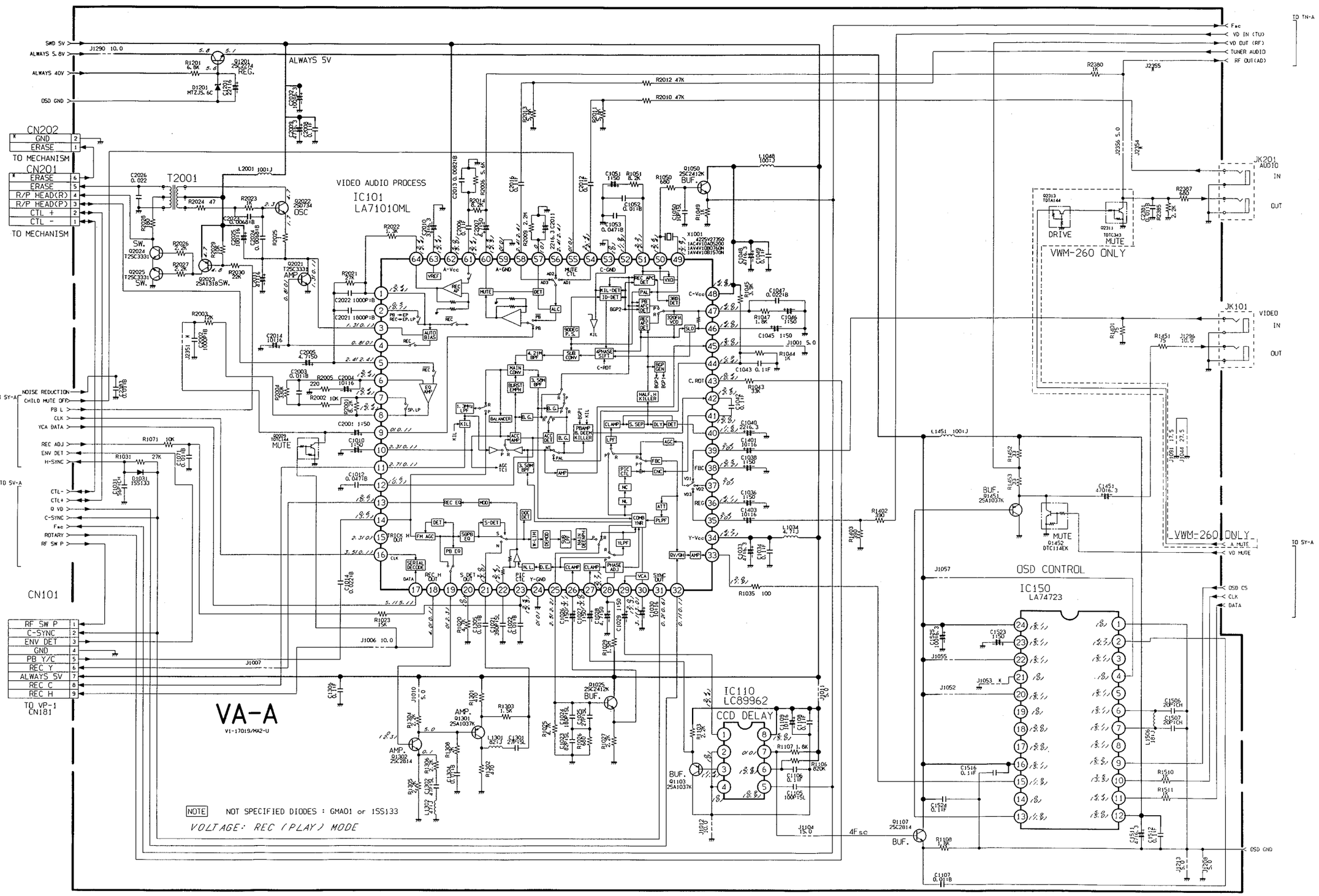
CP-1 BOARD (TN-A) TUNING CONTROL



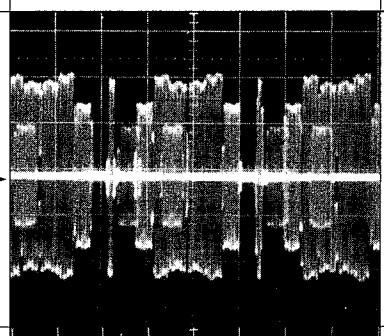
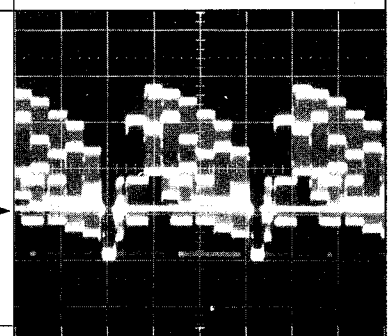
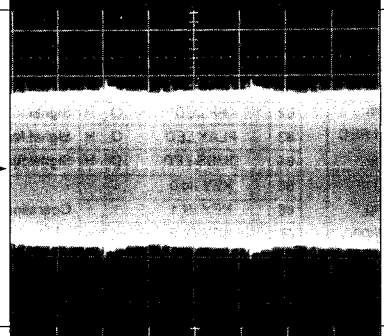
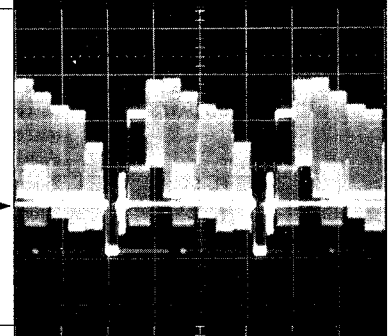
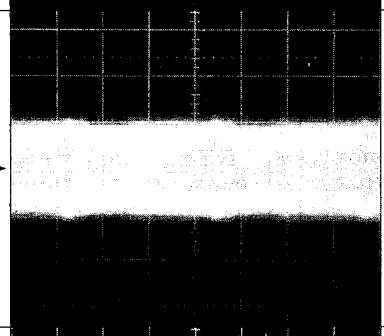
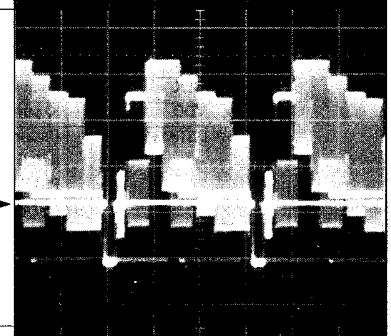
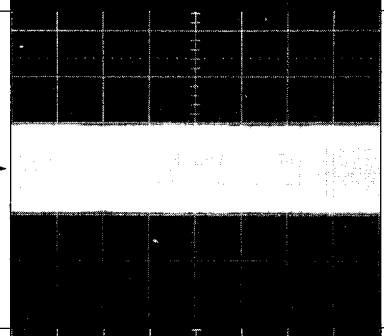
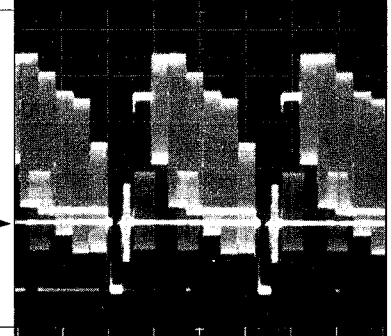
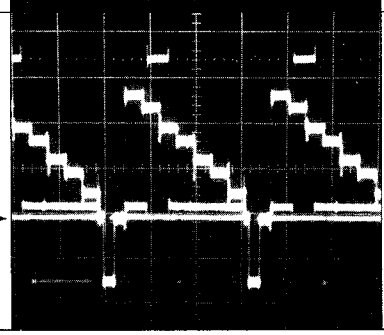
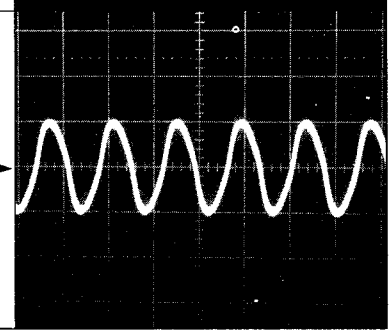
CP-1 BOARD (PW-A) POWER SUPPLY (VWM-260 ONLY)



CP-1 BOARD (VA-A) VIDEO & AUDIO

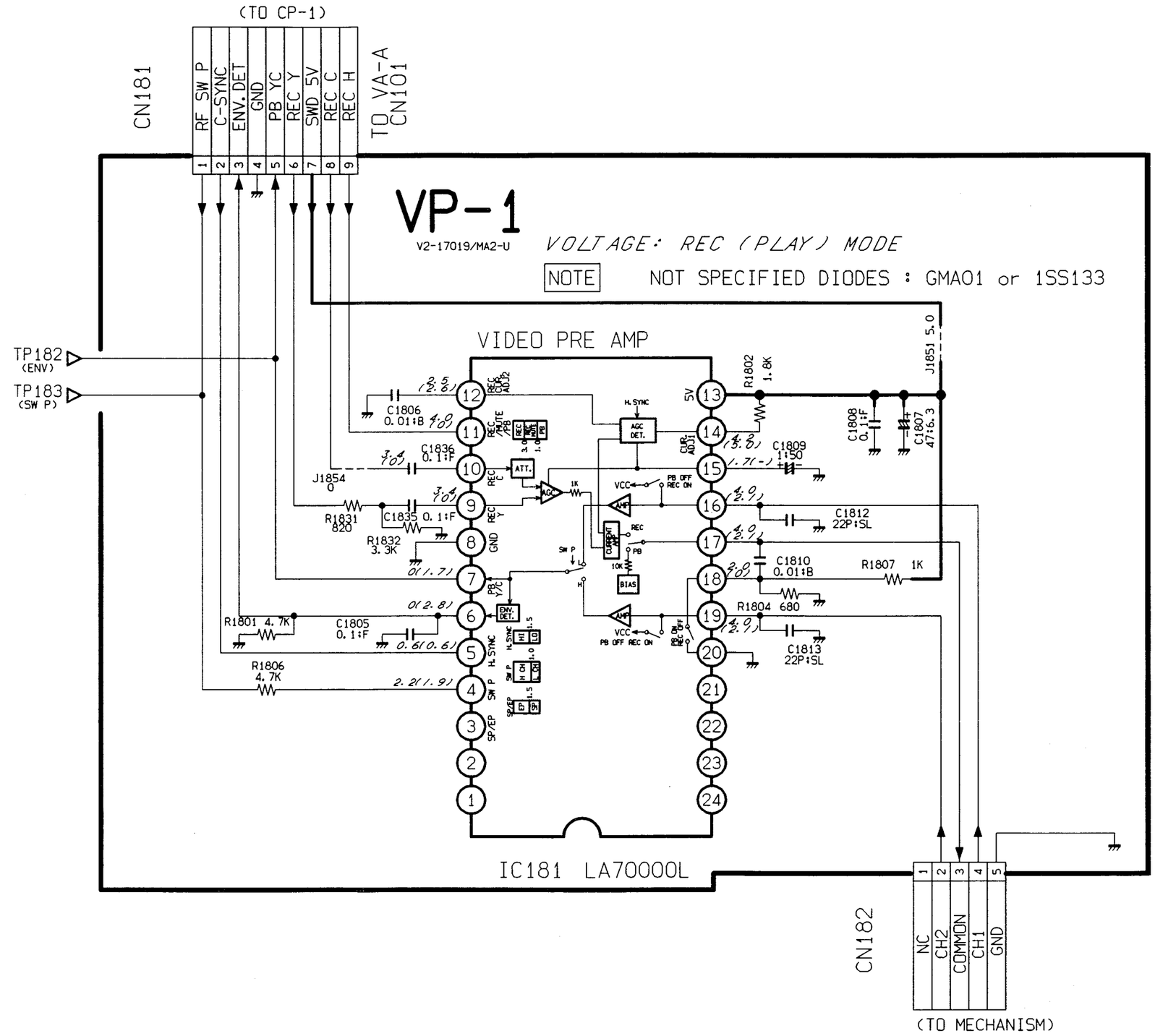


VIDEO CIRCUIT WAVEFORMS

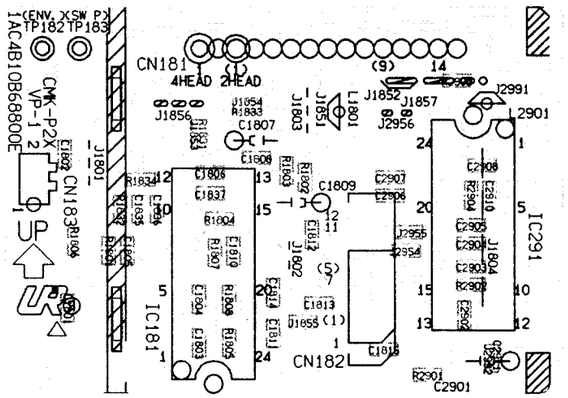
TEST LOCARION	WAVE FORM	TEST LOCARION	WAVE FORM
IC101 PIN11 REC 0.4Vpp 2.7Vdc		IC101 PIN27 REC,PLAY 0.35Vpp 3.0Vdc	
IC101 PIN13 REC 0.4Vpp 3Vdc		IC101 PIN29 REC,PLAY 0.35Vpp 3.0Vdc	
IC101 PIN14 PLAY 0.4Vpp 3.0Vdc		IC101 PIN33 REC,PLAY 2.2Vpp 1.4Vdc	
IC101 PIN19,21 PLAY 0.4Vpp (19) 2.5Vdc (21) 3.0Vdc		IC101 PIN35,37,39 REC 1Vpp 2Vdc	
IC101 PIN25,26 REC,PLAY 0.5Vpp (25) 2.5Vdc (26) 3.0Vdc		Q1050 (E) REC,PLAY 0.4Vpp 2Vdc	

WF-V-MA4U

VP-1 BOARD VIDEO PRE-AMP

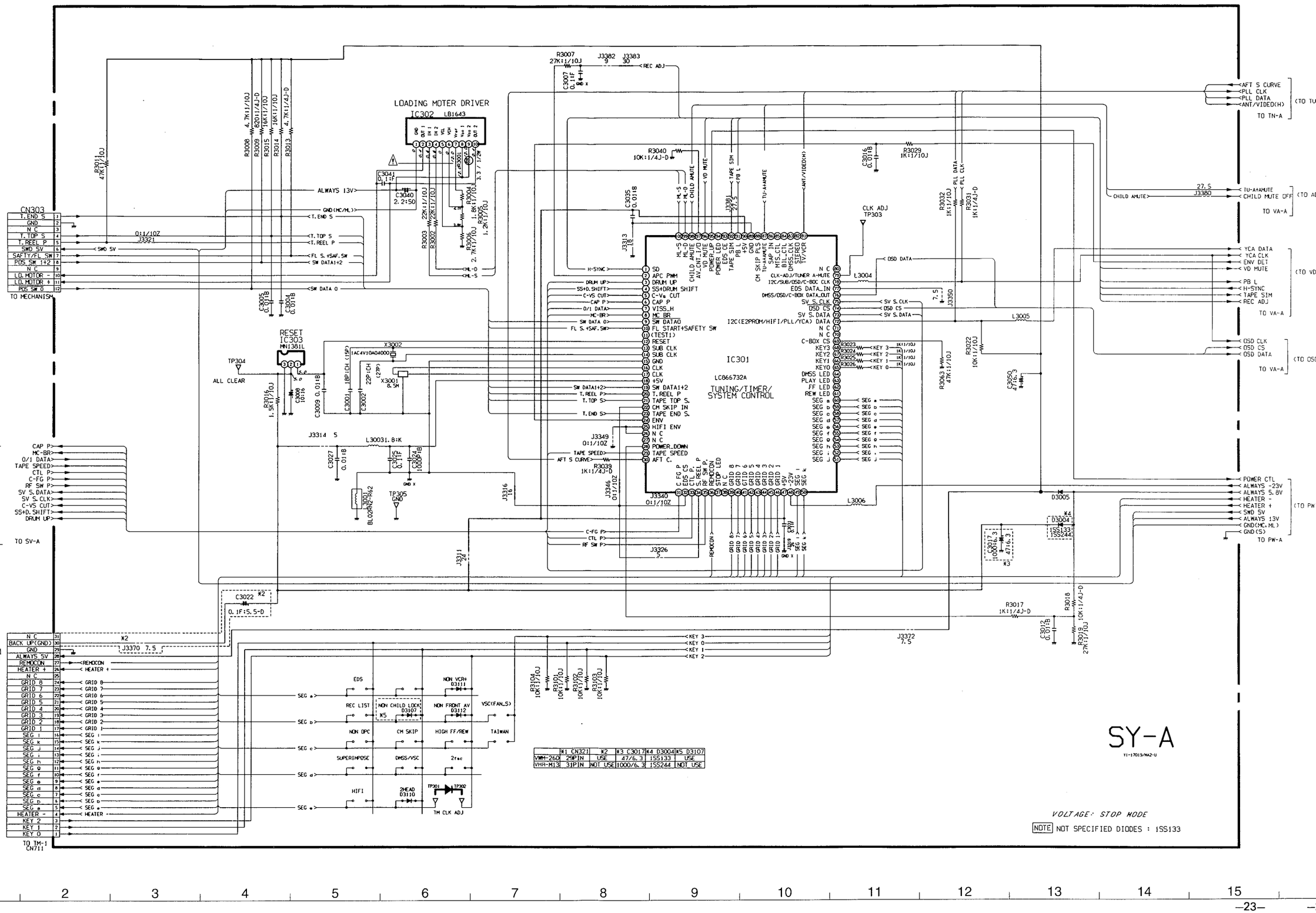


VP-1 P.W.B. (N.S.P.)



WF-V-MA4U

CP-1 BOARD (SY-A) SYSTEM CONTROL, TIMER & TUNER



	※1 CN321	※2	※3 C3017	※4 D3004	※5 D3107
VWH-260	29PIN	USE	47/6.3	1SS133	USE
VHR-M13	31PIN	NOT USE	1000/6.3	1SS244	NOT USE

IC30

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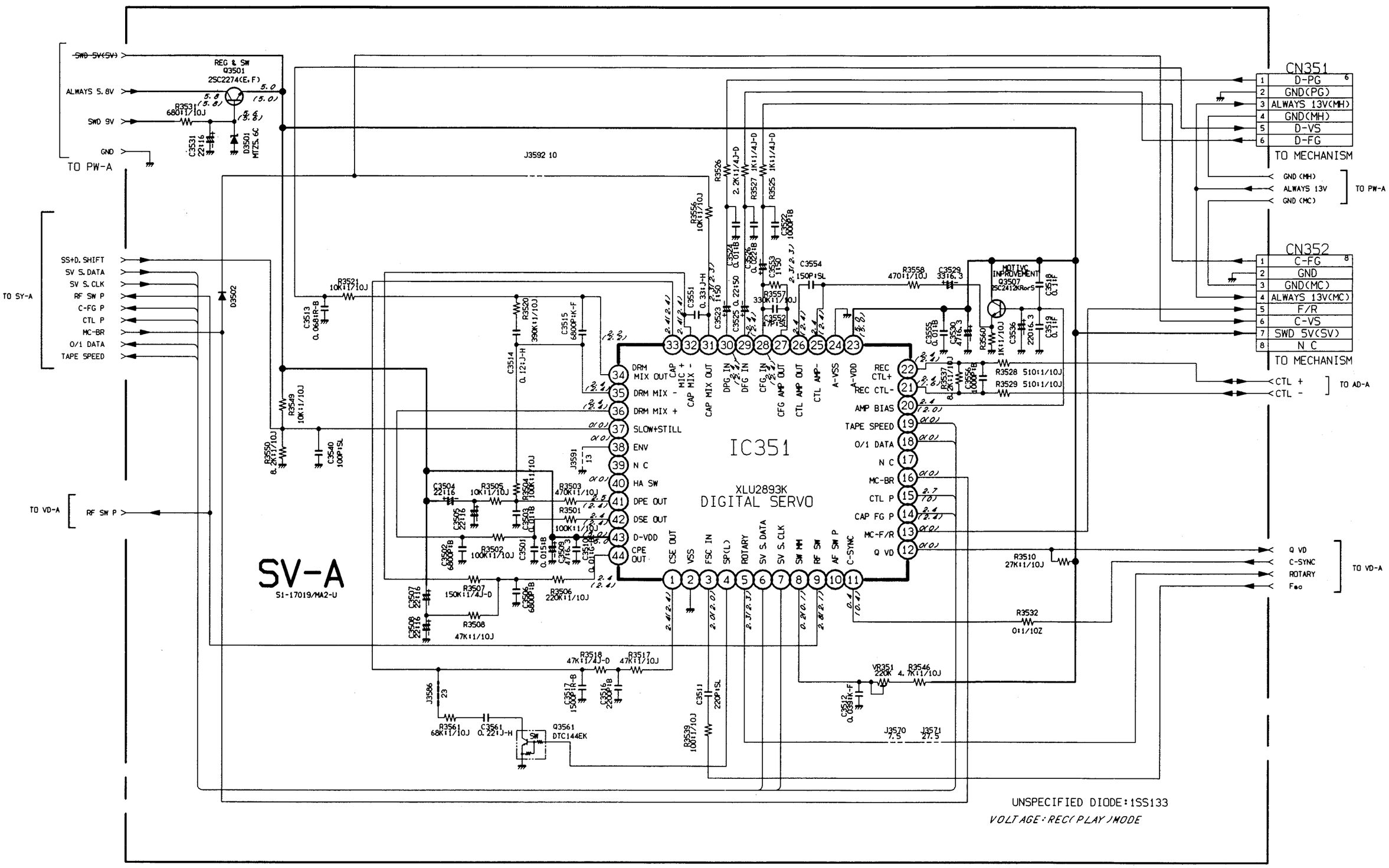
IC301 SYSTEM CONTROL,TIMER & TUNING CONTROL MPU PIN FUNCTIONS TABLE

No.	Name	I/O	H/L	I/O Signal Function
1	SD	I	-	Sync. signal input for existing channel discrimination and TV system discrimination.
2	APC PWM	O	-	Video frequency characteristics control signal for picture control.
3	DRUM UP	O	H	Head drum motor rotation speed up signal.
4	SS + DRUM SHIFT	O	-	Signal for in licating SLOW/STILL modes and alternation of drum motor control data. (3 value voltage)
5	C - Vs CUT	O	H	Cut off for capstan motor control voltage in SLOW / STILL modes.
6	CAP P.	O	-	Gain down control for Head Motor at SLOW mode.
7	VISS H	I	H	CTL pulse duty detection signal input. Used for VISS detection.
8	MC - BR	O	H	Brake signal for capstan motor.
9	SW DATA0	I	-	Data indicating operation position of mechanism. (0V : SEARCH,STILL,SLOW,STOP,PLAY, and REC modes) (5V : EJECT,REW, and INITIAL modes)
10	FL- START + SAFETY SW	I	L	Switch input indicating start of cassette loading or discharge by cassette mechanism and detecting accidental erasure prevention tab of cassette tape.
11	-	-	-	
12	RESET	I	-	Initial reset terminal for this IC.
13	SUB CLK	-	-	Clock OSC during power failures.
14	SUB CLK	-	-	Frequency is 32kHz.
15	VSS	-	-	Ground terminal
16	CLK	-	-	IC clock OSC terminal.
17	CLK	-	-	Frequency is 8.5MHz.
18	VDD	-	-	IC power supply terminal.(5Vdc)
19	SW DATA1+2	I	-	Data indicating operation position of mechanism. (2V: EJECT,REW ,and INITIAL modes)(3.4V: STOP, PLAY,REC, and F-SEARCH modes) (2.5V: STILL and SLOW modes) (5V: R-SEARCH mode)
20	T. REEL S.	I	-	Pulse input for detection of take-up reel table rotation.
21	T. TOP S.	I	L	Sensor signal input for tape beginning detection.
22	CM SKIP IN	I	-	NOT USE
23	T. END S.	I	L	Sensor signal input for tape end detection.
24	ENV.	I	-	Video head envelope detection signal input for ATR function.
25	HiFi ENV.	I	-	Hi-Fi audio head envelope detection signal input for ATR function. (Hi-Fi model only)
26	-	-	-	-
27	-	-	-	-
28	POWER DOWN	I	L	Power failure detection terminal.
29	TAPE SPEED	I	-	Input of result of tape speed discrimination by digital servo IC.
30	AFT - C	I	-	Tuner AFT S-curve signal input for tuner AFT control.
31	C - FG P.	I	-	FG signal input of capstan motor.
32	EDS CS	O	H	Chip Select signal for EDS IC.
33	CTL P.	I	-	CTL head recording / playback pulse signal input.
34	S. REEL S.	I	L	Pulse input for detection of supply reel table rotation.
35	RF SW P.	I	-	RF switching pulse input, created by head drum PG.
36	REMOCON	I	-	Remote control signal input.
37	STOP LED	O	H	Signal for indicating STOP mode.
38	-	-	-	-
39	G8	O	-	Display grid outputs (FLD).
40	G7	O	-	
41	G6	O	-	
42	G5	O	-	
43	G4	O	-	
44	G3	O	-	
45	G2	O	-	
46	G1	O	-	
47	VDD	-	-	IC power supply input.(5Vdc)
48	V LOAD	O	-	-23V input for FLD drive.

No.	Name	I/O	H/L	I/O Signal Function
49	SEG l	O	-	Display segment outputs (FLD). (Includes key-scan output)
50	SEG k	O	-	
51	SEG j	O	-	
52	SEG i	O	-	
53	SEG h	O	-	
54	SEG g	O	-	
55	SEG f	O	-	
56	SEG e	O	-	
57	SEG d	O	-	
58	SEG c	O	-	
59	SEG b	O	-	
60	SEG a	O	-	
61	REW LED	O	H	Signal for indicating REWIND mode.
62	FF LED	O	H	Signal for indicating STOP mode.
63	PLAY LED	O	H	Signal for indicating STOP mode.
64	DMSS LED	O	H	Signal for indicating STOP mode.
65	KEY IN 0	I	-	Operation key data inputs.
66	KEY IN 1	I	-	
67	KEY IN 2	I	-	
68	KEY IN 3	I	-	
69	CABLE BOX CS	O	H	CS signal for cable box control IC.
70	-	-	-	-
71	-	-	-	-
72	I2C .DATA	I/O	-	Data exchange with tuning memory,E2PROM, HiFi audio & YCA IC.
73	SV S. DATA	O	-	Output 8-bit X 4 serial data giving operation mode and tracking data, etc., to digital servo IC.
74	OSD CS	O	H	Chip enable (access) signal output to OSD IC.
75	SV S. CLK	O	-	The clock pulse for digital servo IC.
76	COMMON DATA	O	-	Terminal for communication of respective data with DMSS, OSD & C-BOX IC
77	EDS DATA IN	I	-	Data input from EDS decoder??????.
78	COMMON CLK	O	-	The clock pulse for I2C ROM,sub CPU, IC.
79	TUNER A MUTE	O	H	Signal for disable the tuner audio signal. (HiFi set)
80	-	-	-	-
81	TV/VCR	O	-	Signal for selecting antenna or VCR.
82	STREO	I	H	STREO mode indicating signal input from decoder.
83	DMSS CLK	O	-	Clock signal for audio DMSS unit.
84	BIL CTL	O	H	Bilingual mode indicating signal output to decoder.
85	MTS CTL	O		
86	SAP IN			
87	A MUTE	O	H	Signal for disable the audio signal.
88	CM SKIP PULSE	-	-	NOT USE
89	VSS	-	-	IC ground terminal.
90	VDD	-	-	IC power supply input.(5Vdc)
91	PB L	O	L	Signal for indicating playback mode.
92	TAPE SIM	-	-	NOT USE
93	EDS CE	-	-	NOT USE
94	POWER LED	O	H	NOT USE
95	POWER UP	O	H	"HIGH" output except when power is off. Indicating that power is ON.
96	VD MUTE	O	H	"H" output for disable video output signal.
97	AV CNT I/O	O	-	Signal for selecting AV-input(video/audio)source.
98	CHILD A MUTE	O	H	"H" output for disable audio,video output signal.
99	ML- S	O	-	Loading motor rotation speed (low / medium / high) indication signal.
100	ML- D	O	-	Loading motor rotation direction (FWD / REV) indication signal.

MA4_TTS

CP-1 BOARD (SV-A) SERVO



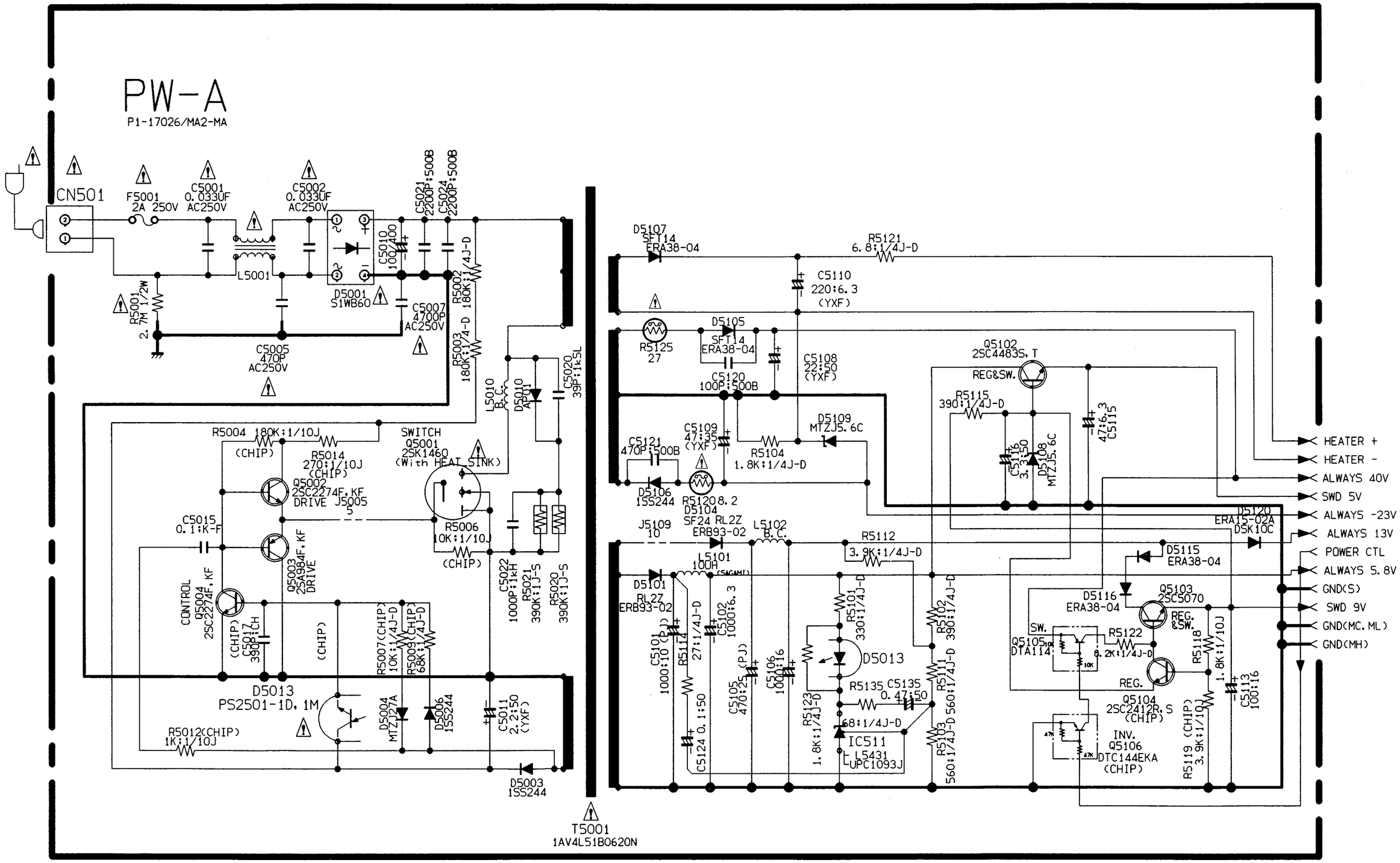
SERVO

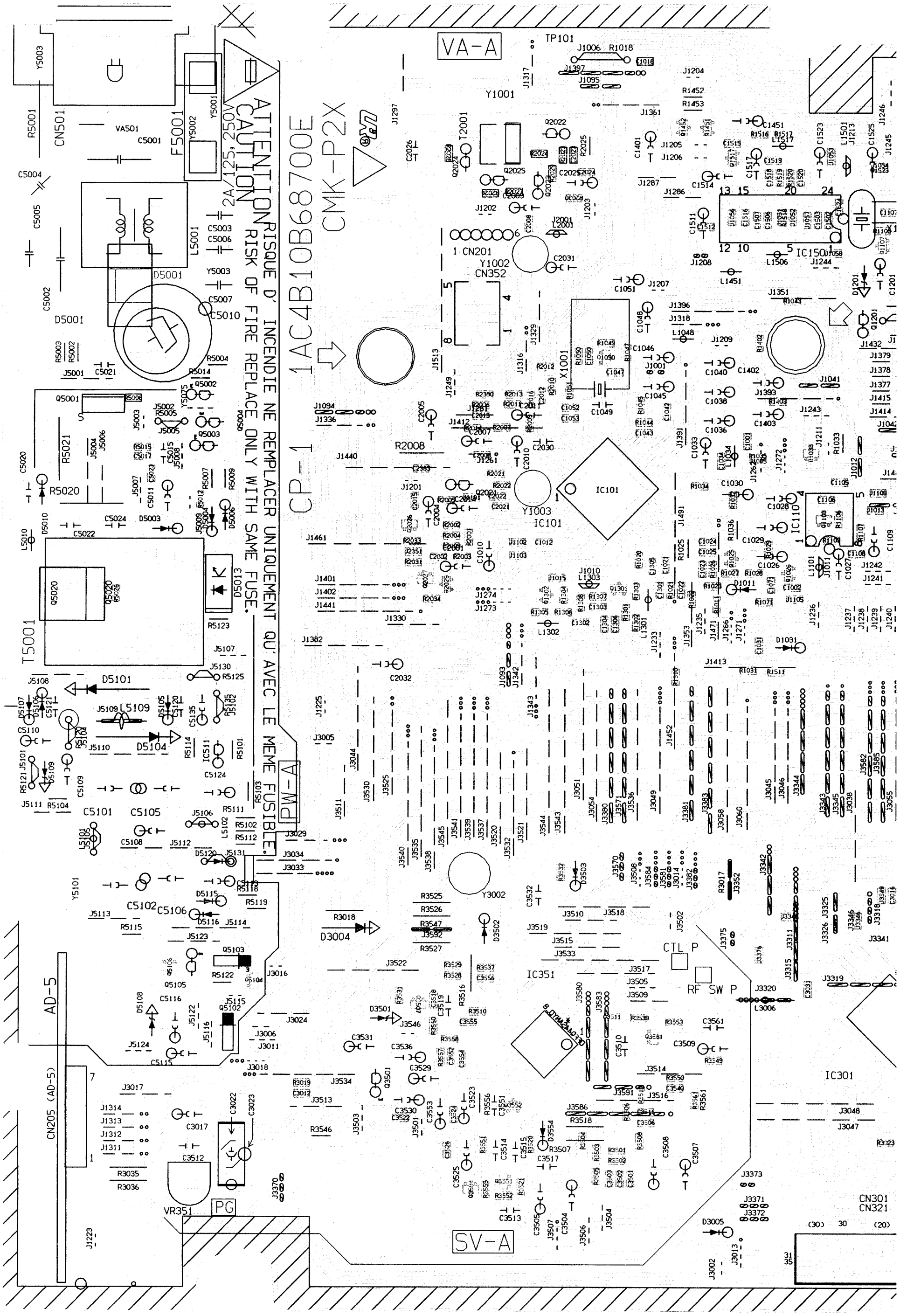
TEST L
Pin 40 (H. A. SW
Pin 42 (PWM)
Pin 41, 4 (PWM)
Pin 3 (FSC IN
Pin 5 (ROTARY
Pin 8 (D-PG M
Pin 9 (RF SW
Pin 10 (AF SW
Pin 11 (COMPOS SYNC
Pin 14 (C-FG P

SERVO CIRCUIT WAVEFORMS

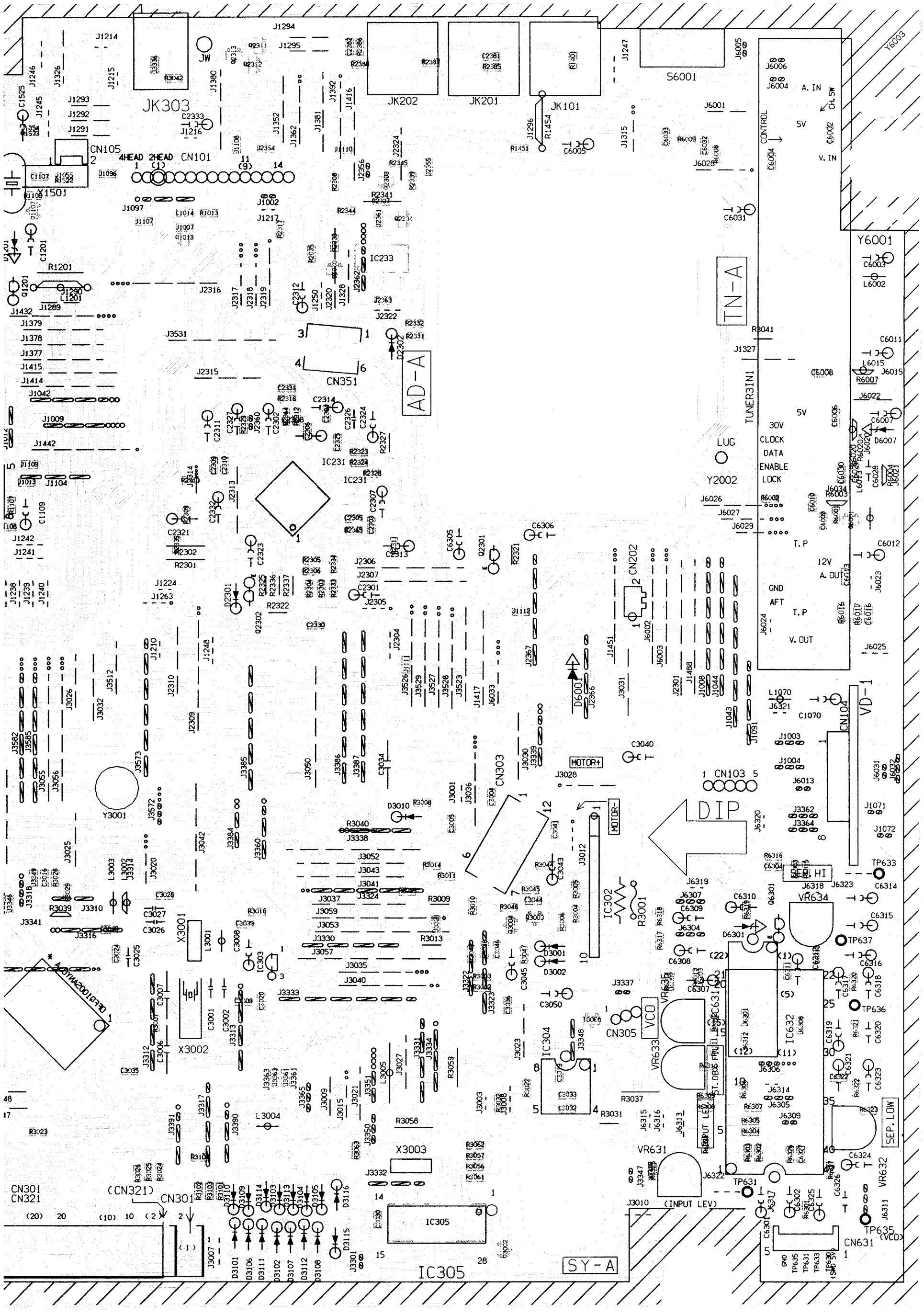
TEST LOCATION	WAVEFORM & MODE/LEVEL	TEST LOCATION	WAVEFORM & MODE/LEVEL
Pin 40 (H. A. SWITCHING)	STILL/SLOW 5.2V 16.7msec 16.7msec	**Pin 15** (CTL PULSE)	REC 5.2V 20.7msec 12.6msec
Pin 42 (PWM)	5.2V 6.99KHz	**Pin 15** (CTL PULSE)	PB 480µsec 5.2V 33.3msec
Pin 41, 44, 1 (PWM)	5.2V 55.9KHz	**Pin 21** (CTL HEAD-)	REC 3.6V 1.6V 20.7msec 12.6msec
Pin 3 (FSC INPUT)	0.6V 3.58MHz	**Pin 22** (CTL HEAD+)	REC 1.6V 3.6V 20.7msec 12.6msec
Pin 5 (ROTARY)	PB 5.2V 16.7msec 16.7msec	**Pin 26** (CTL AMP OUT)	PB 2.4V 33.3msec
Pin 8 (D-PG MM)	1.5msec 2.6V 5.6msec	**Pin 28** (C-FG INPUT)	10mV 0.47msec
Pin 9 (RF SW PULSE)	5.2V 16.7msec 16.7msec	**Pin 29** (D-FG INPUT)	30mV 1.12msec
Pin 10 (AF SW PULSE)	PB 5.2V 16.7msec 16.7msec	**Pin 30** (D-PG INPUT)	300mV 33.3msec
Pin 11 (COMPOSITE SYNC INPUT)	4.2V T=16.7msec	**Pin 38** (ENV. SW INPUT)	SLOW PB 4.0V 16.7msec 16.7msec
Pin 14 (C-FG PULSE)	5.2V 1.07KHz		

WF-S-MA2


PW-A
P1-17026/MA2-MA
CN501
F5001 2A 250V
C5001 0.033UF AC250V
C5002 0.033UF AC250V
C5021 2200P;500B
C5024 2200P;500B
C5010 100/400
L5001
D5001 S1WB60
R5001 2.7M 1/2W
C5007 4700P AC250V
C5005 470P AC250V
R5002 180K;1/4J-D
R5003 180K;1/4-D
L5010 B.C.
D5010 AP01
C5020 39P;1kSL
R5004 180K;1/10J (CHIP)
R5014 270;1/10J (CHIP)
SWITCH Q5001 2SK1460 (With HEAT SINK)
Q5002 2SC2274F, KF DRIVE J5005 5
R5006 10K;1/10J (CHIP)
C5015 0.1;K-F
Q5003 2SA984F, KF DRIVE
CONTROL Q5004 2SC2274F, KF
C5017 390P;CH
R5007(CHIP) 10K;1/4J-D
R5009(CHIP) 68K;1/4J-D
C5022 1000P;1kH
R5021 390K;1J-S
R5020 390K;1J-S
D5013 PS2501-1D, 1M
D5004 MTZJ27A
D5006 1SS244
C5011 2.2;50 (YXF)
R5012(CHIP) 1K;1/10J
D5003 1SS244
T5001 1AV4L51B0620N
D5107 SFT14 ERA38-04
R5121 6.8;1/4J-D
C5110 220;6.3 (YXF)
R5125 27
D5105 SFT14 ERA38-04
C5108 22;50 (YXF)
C5120 100P;500B
Q5102 2SC4483S, T REG&SW.
R5115 390;1/4J-D
C5116 3.3;50
D5108 MTZJ5.6C
47;6.3 C5115
C5109 47;35 (YXF)
D5109 MTZJ5.6C
R5104 1.8K;1/4J-D
C5121 470P;500B
D5106 1SS244
R5120 8.2
D5104 SF24 RL2Z
J5109 10
ERB93-02
L5102 B.C.
R5112 3.9K;1/4J-D
L5101 10UH (SAGAMI)
D5101 RL2Z ERB93-02
C5101 1000;10 (PJ)
R5114 27;1/4J-D
C5102 1000;6.3
C5124 0.1;50
C5105 470;25 (PJ)
C5106 1000;16
R5101 330;1/4J-D
D5013
R5135 C5135 0.47;50
R5123 1.8K;1/4J-D
68;1/4J-D
IC511 L5431 UPC1093J
R5102 390;1/4J-D
R5103 560;1/4J-D
R5111 560;1/4J-D
D5115 ERA38-04
D5116 ERA38-04
Q5103 2SC5070 REG. &SW.
Q5105 DTA114
R5122 8.2K;1/4J-D
REG.
Q5104 2SC2412R, S (CHIP)
INV. Q5106 DTC144EKA (CHIP)
R5118 1.8K;1/10J
R5119 (CHIP) 3.9K;1/10J
C5113 100;16
D5120 ERA15-02A D5K10C
HEATER +
HEATER -
ALWAYS 40V
SWD 5V
ALWAYS -23V
ALWAYS 13V
POWER CTL
ALWAYS 5.8V
GND(S)
SWD 9V
GND(MC.ML)
GND(MH)


CP-1
1AC4B10B68700E
CMK-P2X
ATTENTION RISQUE D' INCENDIE NE REMPLACER UNIQUEMENT QU' AVEC LE MEME FUSIBLE.
CAUTION RISK OF FIRE REPLACE ONLY WITH SAME FUSE.
2A/125, 250V
VA-A
SV-A
PG
CN501
F5001
T5001
L5001
L5109
D5001
D5101
D5104
D5013
D3004
D3005
IC101
IC351
IC301
IC1501
IC1104
X1001
Y1001
Y1002
Y1003
Y3002
CN352
CN201
CN205 (AD-5)
AD-5
CTL P
RF SW P
TP101
VR351

B. (N.S.P.)


JK303
JK202
JK201
JK101
S6001
Y6003
Y6001
CN105
CN101
X1501
IC233
IC231
CN351
AD-A
CN202
TUNER3IN1
CONTROL
A. IN
CH. SW
5V
V. IN
12V
A. OUT
GND
AFT
T. P
V. OUT
30V
CLOCK
DATA
ENABLE
LOCK
LUG
Y2002
TN-A
VD-1
CN104
CN103
DIP
MOTOR+
MOTOR-
CN303
IC302
R3001
VR634
VR635
VR633
VR631
VCO
CN305
IC632
IC304
IC305
SEP. HI
SEP. LOW
SY-A
CN631
TP633
TP637
TP636
TP635
TP631
CN301
CN321
X3001
X3002
X3003
Y3001
D6001
D6007
D3001
D3002
D2301
D2302
D3010
L6002
L6015
L1070
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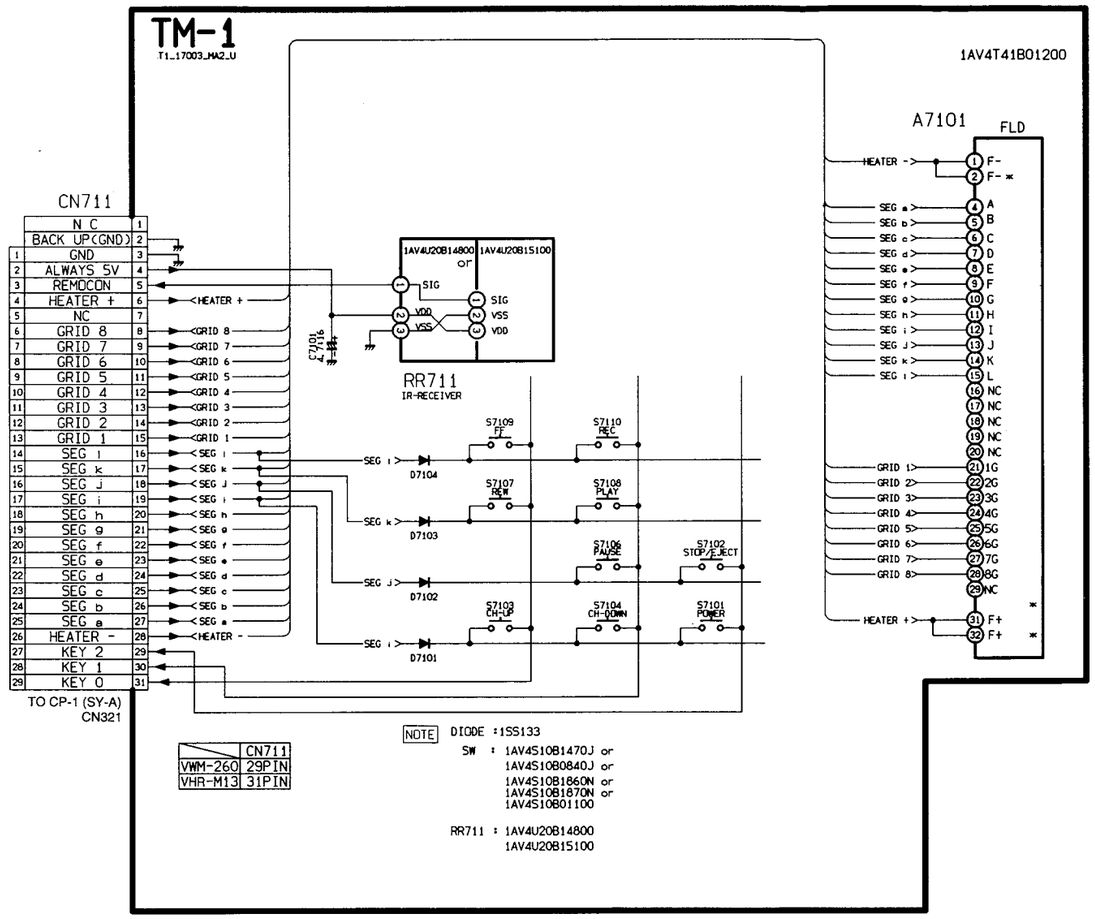
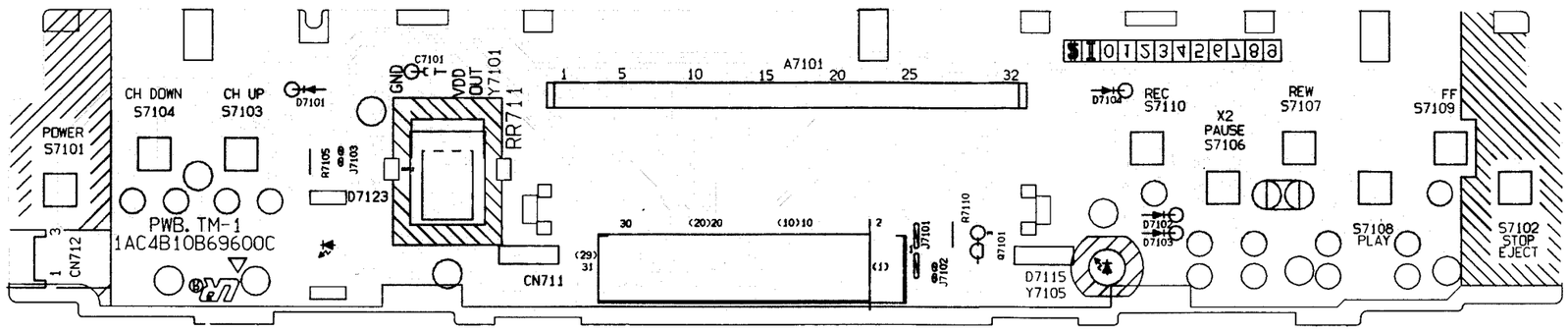
TM-1 BOARD OPERATION KEY & DISPLAY

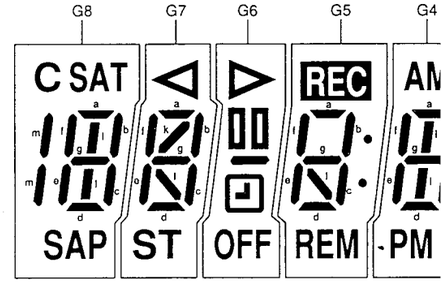


TM-1 P.W.B. (N.S.P.)



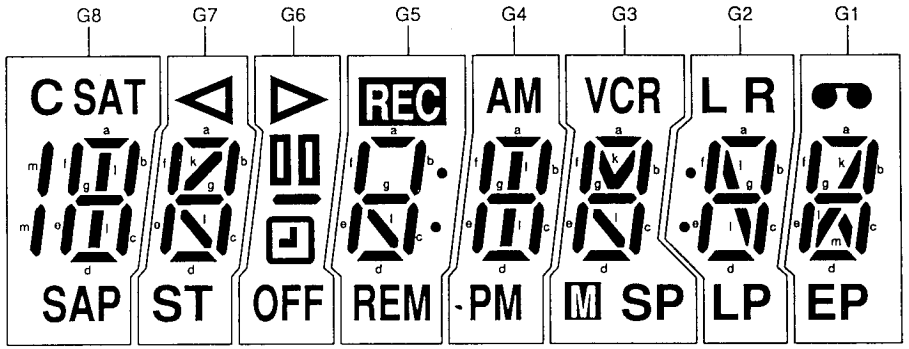
A7101 DISPLAY (FLD) G

GRID & SEGMENT ASS



A7101 DISPLAY (FLD) GRID/ANODE ASSIGNMENT DRAWING & TABLE

GRID & SEGMENT ASSIGNMENT



ANODE CONNECTION

GRID / SEGMENT	G8	G7	G6	G5	G4	G3	G2	G1
a	C	◁	▷	REC	AM	VCR	L	☎
b	SAT	k	▯▯	—	—	k	R	k
c	a	a	▬	a	a	a	a	a
d	b	b	◪	b	b	b	b	b
e	c	c	—	c	c	c	c	c
f	d	d	—	d	d	d	d	d
g	e	e	—	e	e	e	e	e
h	f	f	—	f	f	f	f	f
i	g	g	—	g	g	g	g	g
j	l	l	—	l	l	l	l	l
k	m	—	—	:	—	M	:	m
l	SAP	ST	OFF	REM	PM	SP	LP	EP

GR-01200